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ABSTRACT

The purposes of this booklet are (a) to suggest the kinds of research needed to close the knowledge gap that now exists with respect to competency based teacher education (CBTE), (b) to build a case for CBTE programs as contexts for research in education and teacher education, and (c) to outline a framework for proceeding with basic research in these areas. The booklet outlines four different kinds of studies that need to be undertaken. These are (a) studies of alternative approaches to the mastery of teaching competencies; (b) studies to collect information to facilitate broad policy-level decisions about CBTE; (c) studies to search for new constructs and new ways of measuring constructs, to test models, and to search for principles of instruction that can be applied to teacher education; and (d) studies to describe the development, structure, operation, and/or diffusion of programs. The remaining sections of the booklet deal with how CBTE programs can be organized so as to function as contexts for research as well as training, and how the program of research might best be implemented. Two examples of programs which are now functioning as research contexts are described, and a plan for implementing the research and documentation program being called for is outlined. An appendix is included which describes a competency based teacher education project for the Consortium of Southern Colleges for Teacher Education. (RC)

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CLOSING THE KNOWLEDGE GAP

CBTE Programs as a Focus and Context Research in Education

A Position Paper
of
The Consortium of CBE Centers

H. Del Schalock

And the Research Committee of the Consortium

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March 1975

Preface

This paper has three purposes. The first is to suggest the kinds of research needed to close the knowledge gap that now exists with respect to competency-based teacher education. The second is to build a case for CBTE programs as unusually rich contexts for research in education and teacher education. The third is to outline a framework for proceeding with basic research in education and teacher education that carries with it the hope of yielding information of greater utility to practitioners than it has in the past.

The paper stems from the experience of the directors of the USOE-sponsored elementary teacher education models projects in attempting to design and implement CBTE programs in their own institutions, or in attempting to help others do so. In the course of these efforts all have experienced the frustration of not having sufficient information on which to base program design decisions; all have recognized that there is little hope of improving the quality of what is being done until there is increased knowledge of what works and what does not work; and all have felt concern about the rapid move to adopt CBTE programs without clear evidence that what is being adopted is any better than what has been in operation in the past. The program of research that has been proposed by the Consortium of CBE Centers is designed to overcome these shortcomings and, in the course of doing, move both education and teacher education closer to a mode of operation that is empirically based.

Because the research program that is proposed is designed to close the knowledge gap for educational policy makers and educational practitioners, as well as educational theoreticians and researchers, all sections of the monograph may not be equally interesting to all readers. Persons concerned with broad policy questions about CBTE, for example, or with questions bearing upon the decision to implement or not implement CBTE, may find the sections dealing with practice-oriented and basic research studies of little interest. Practitioners, on the other hand, as well as educational theoreticians and researchers, will probably find these sections to be of greatest interest. In the judgment of those who helped in the preparation of the paper, however, all of the broad categories of research dealt with are equally important, for each attends to a particular kind of research that will provide a particular kind of information that is critically needed by a particular set of people working within the arena of education and teacher education.

Hopefully all of the recommendations outlined in the paper will in time be implemented, for until the knowledge gaps that are alluded to are reduced, there is little hope that education as a profession will be able to do in the United States what it has been asked to do.

H. D. Schalock
Monmouth, Oregon
March, 1975

FOREWORD

The Multi-State Consortium on Performance-Based Teacher Education is pleased to make available to interested readers this discussion of one of the issues of current import in the continuing effort to improve teacher education.

The Consortium wishes to acknowledge its gratitude to the National Consortium of CBE Centers for permission to publish and distribute the catalog.

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PART I. BACKGROUND AND OVERVIEW[1]

A decade ago the language of *competency-based* teacher education (CBTE) did not exist. Now it is commonplace. In the brief period since the completion of Phase I of the Elementary Models project, an educational development effort funded in 1969 by the National Center for Educational Research and Development, U.S. Office of Education, approximately half of the teacher education institutions in the nation have begun either to operate, develop or plan CBTE-type programs. Even more remarkable is the fact that within this same time period, approximately half of the states within the nation have adopted or are moving to adopt certification and accreditation standards that call for such programs, and the concepts of CBTE have begun to appear in the literature of education generally (Schmieder, 1973).

It is fair to say that few innovations in the history of American education, especially when they are as complex and far reaching as CBTE, have spread so far in such little time.

The Growth Of CBTE In The Absence Of Knowledge

Though a number of arguments have been advanced in support of the advantages of competency-based over traditional teacher preparation programs (Elam, 1971; Cooper, *et al.*, 1973; Schmieder, 1973), it remains somewhat of a mystery as to why the American educational community has adopted the philosophy and procedures of CBTE so readily. CBTE does, of course, possess a number of features that are responsive to the times. It is responsive to the growing demand for educational accountability, for example, through insisting that desired learning outcomes be made public, that performance standards be held for the objectives stated and that both student and program success be measured in terms of the ability to meet such standards. It also possesses features that are responsive to the growing demand for the personalization of instruction, the introduction of *relevance* (through a field-based mode of operation) to the program, and the demonstration of program planning and operation. Even so, it is hard to believe that such features by themselves account for the phenomenal spread of the CBTE movement, since they are all features of program operation which have been available to the education community for a long while.

Another feature of CBTE that adds mystery to its history of adoption is the lack of unanimity that surrounds its meaning (Hamilton, 1973). What CBTE is may be clear as it is defined at one institution and, at the same time, be radically different from an equally clear meaning of CBTE at another institution. Beyond the general agreement that the *essential* features of CBTE are the requirements that the objectives of instruction be made public, that performance standards in relation to those objectives be made explicit, and that learning success be measured in terms of ability to meet performance standards that have been specified, CBTE means different things to different people. To some it

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1 Competency-based teacher education, performance-based teacher education, and criterion-referenced teacher education are terms that often are used interchangeably. As a matter of author preference, the competency-based language is used in the present document.

simply means the translation of existing course content into an instructional mode that contains a clear statement of objectives, performance criteria, etc. To others it means the identification of the *skills* of teaching, establishing performance criteria for those skills, and developing means of assessing performance in relation to them. To still others, it means identifying the outcomes expected from a teacher in a certificated teaching position, establishing the standards of performance expected in relation to those outcomes, and then developing procedures for obtaining evidence of performance in relation to them. Such similarities and differences are imbedded in Stanley Elam's early and widely accepted definition of CBTE:

> . . . . in performance-based programs performance goals are specified, and agreed to, in rigorous detail in advance of instruction. The student must either be able to demonstrate his ability to promote desirable learning or exhibit behaviors known to promote it. He is held accountable, not for passing grades, but for obtaining a given level of competency in performing the essential tasks of teaching; the training institution is itself held accountable for producing able teachers. Emphasis is on demonstrated product or output. (Elam, 1971, pp. 1 and 2.)

Programs that vary in such fundamental ways obviously reflect differing views as to what is meant by teaching competence and, in all likelihood, produce teachers who vary in initial ability to function effectively within an ongoing school setting (Schalock, 1974).[2]

Whatever the factors that have attracted the educational community to the concepts of CBTE, the nature of the educational returns that can be expected from the movement remains at the level of projection. While an increasing number of institutions are establishing operational CBTE programs, there is as yet little evidence that the educational returns from such programs are greater than those from traditionally designed programs. It can be argued, of course, that because of *assumed* better preparation, or *assumed* better selection due to more stringent program exit requirements, prospective teachers going through CBTE programs will have greater success as they enter the profession than will teachers from non-CBTE programs. As yet, however, no one knows this in fact to be the case.

Moreover, even if it should turn out that teachers from CBTE programs are more successful as they enter the profession, what about long-term benefits? If it should be found that beginning teachers from CBTE programs have an advantage over beginning teachers from traditional programs, would that advantage be maintained over time? Do CBTE programs actually lead to the selection of teachers that are going to be more successful in effecting learning outcomes in children, or is there a *catch-up* phenomenon that permits teachers from traditional programs to pull even with, or even surpass in time, the performance levels of their CBTE counterparts?

These are critical questions that need firm answers, for the sake of both the profession at large and the institutions contemplating the adoption of a CBTE mode of operation. And, like it or not, they are questions that can be answered only through research.

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[2] In the context of this discussion, it should be noted that another monograph is being prepared by the Consortium of CBE Centers that deals with the criterion problem in competency-based teacher education. It lists twenty-six essential elements which cut across individual definitional differences found in CBTE programs.

Assuming for the moment that the education returns from CBTE are appreciably greater than the returns from traditional teacher education programs, there remains the question of the relationship of costs to benefits. At present we have only the barest of data on costs associated with a CBTE mode of operation (Hite, 1974; Schalock, Kersh and Garrison, 1974), and in only one instance has an effort been made to show cost/benefit relationships (Kersh, Garrison and Schalock, 1974). There are also a host of questions that pertain to program operation. At present, for example, we have no firm evidence that one set of *teaching competencies* is more productive of learning in children than another set; that one level of competency definition is better than another level; that one approach to program organization and instruction is better than another in bringing about desired competencies, etc., etc.

The Rationale For A Position Paper On Research In Competency-Based Teacher Education At This Point In Time

The preparation of the present paper stems from the experience of the elementary model directors in attempting to design and implement CBTE programs in their own institutions, or in attempting to help others do so. In the course of these efforts all have experienced the frustration of not having sufficient information on which to base program design decisions; all have recognized that there is little hope of improving the quality of what is being done until there is increased knowledge of what works and what does not work; and all have felt concern about the rapid move to adopt CBTE programs without clear evidence that what is being adopted is any better than what has been in operation in the past.

The program of research that is outlined in the pages that follow is designed to overcome these shortcomings, and in the course of so doing move both education and teacher education closer to a mode of operation that is empirically based.

In addition to the pressing need to know, three other conditions have contributed to the decision to present these ideas at this point in time. The first is that CBTE programs are reaching a level of maturity that permits the required research to be carried out. Research on the effectiveness of alternative practices or procedures in competency-based teacher education, for example, or research that compares the effects of competency-based and non-competency-based programs, requires operational CBTE programs. Now that such programs are coming into existence, the essential condition for such research has been met.

A second condition that has contributed to the decision to prepare the paper is the increasing demand for evidence as to costs and benefits associated with CBTE. Persons who control funds in support of teacher education programs, and persons who have been led to expect significant changes in the educational system as a function of CBTE programs, are demanding to see data in this regard. Providing such data is seen as a fundamental obligation of the Consortium of CBE Centers, as well as a necessary condition for the survival of the CBTE movement generally.

A third factor that has contributed to the preparation of the paper is the inconsistency that presently exists between theoretical expectations and program implementation so far as a data-based mode of operation is concerned. All of the CBTE elementary models called for continuous program adaptation and for this adaptation to be based upon empirically derived cost and effectiveness data. With few exceptions this basic tenet of the models has not been realized.

The Content And Organization Of The Paper

The paper outlines four different kinds of studies that need to be undertaken if the knowledge gap in relation to CBTE is to be closed for all concerned. These have been labeled

POLICY-ORIENTED STUDIES, PRACTICE-ORIENTED STUDIES, BASIC RESEARCH STUDIES, and DOCUMENTATION STUDIES.

Used in the paper Policy-Oriented Studies are cost-benefit studies that have as their purpose the collection of information that facilitates broad policy-level decisions about CBTE, particularly at the state and federal levels. Two categories of policy-oriented research are proposed: (a) research that compares the costs and benefits of competency-based and non-competency-based programs; and (b) research that compares costs and benefits of CBTE programs that differ in major respects.

By contrast Practice-Oriented Studies are seen as cost-effectiveness studies of alternative approaches to the mastery of teaching competencies within the context of CBTE programs. In some respects, information coming from such studies is of interest to policy makers, for it bears upon the broader issue of program costs and benefits. Generally speaking, however, the results of such studies are of primary interest to program designers and operators for they deal with a level of detail that policy makers are rarely able to consider.[3]

Four broad categories of basic research are dealt with in the paper. The first two of these are the most fundamental of activities in any discipline or profession: (1) the search for new and ever more powerful constructs; and (2) the search for new and ever more powerful ways of measuring constructs. The last two categories deal with the kinds of activities most commonly associated with the label *basic research*: (3) the testing of models (theories); and (4) the search for what has been labeled in the paper as *principles of instruction* that can be applied in education or teacher education.

The decision to devote so much of the paper to the matter of basic research stems from three conditions: the central role that such research plays in the advance of any discipline or profession; the general lack of understanding on the part of educators and teacher educators as to the nature and function of such research; and the downright animosity that many hold toward such research.

The proposal to carry out documentation studies is in response to the need for usable case histories by persons responsible for the development and implementation of CBTE programs. Because of the relative complexity of such programs, and because of the general lack of familiarity with many aspects of their operation, help needs to be given at a *nuts and bolts* level to persons who wish to implement them. Documentation studies are seen as providing this kind of help.

Three kinds of documentation studies are called for: one which describes the development of programs; one which describes the structure and operation of programs; and one which describes the diffusion of programs.

The remaining sections of the paper deal with how CBTE programs can be organized so as to function as contexts for research as well as training, and how the program of research and documentation being called for might be implemented. CBTE programs represent unusually promising contexts for educational research in that they are rich in data. As a consequence, if properly organized, they represent contexts wherein research can be carried out at low cost and high external, as well as internal, validity. Two examples of programs that are now functioning as research contexts are described. A plan for implementing the research and documentation program that is being called for is outlined against a three-, five-, and ten-year time frame.

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[3] It should be noted that information coming from policy and practice oriented studies is as applicable to non-CBTE programs as it is to programs that reflect CBTE characteristics.

PART II. POLICY-ORIENTED STUDIES

Persons responsible for the allocation of resources in support of teacher education need to know whether the educational returns from CBTE programs are greater than those from traditional programs, whether the costs associated with CBTE programs are greater than those associated with traditional programs, and the relation of costs to benefits in both cases. Information of this kind is needed by persons responsible for establishing state and national standards for teacher preparation programs, by institutional executives who must allocate resources in support of programs, and by employees of the federal government who must recommend or make policy relative to the funding of federally sponsored activities that relate to such programs. Without such information, policy decisions must be made of necessity, on some basis other than fact.

As indicated previously, two lines of research need to be undertaken in order to obtain information that facilitates policy decisions. The first involves the comparison of CBTE and non-CBTE programs as to costs and benefits. Studies of this kind would seem to be of foremost importance for decision making at a state and national level, though obviously desirable at an institutional level, for they deal with the two major factors that must be taken into account in policy decisions at any level. The second also involves cost-benefit comparisons, but instead of comparing CBTE and non-CBTE programs, comparisons need to be made between CBTE programs that define teaching competencies or employ program practices and procedures in markedly different ways. Studies of this kind represent an extention of the CBTE/non-CBTE design and need to be carried out in order that program designers have the kind of information they need to make decisions about program structure, focus and operation. For ease of reference, these two designs are referred to hereafter as

- a CBTE/Non-CBTE design, and
- a CBTE Program Variations design.

Before considering the characteristics of these two designs in greater detail, it is important to understand that three conditions are essential to the implementation of either. These are (a) the criteria that define and differentiate desired program variations must be clearly specified; (b) ongoing teacher education programs must exist that meet these specifications; and (c) persons responsible for such programs must be willing to take part in research that compares program effectiveness. Put on other terms, cost-benefit studies of teacher preparation programs of any kind require:

1. clarity as to what constitutes program differences to be compared
2. essentially *pure cases* of mature, fully functional programs that reflect these differences
3. teacher educators willing to submit themselves and their institutions to a comparative research effort.

Given these conditions, policy-oriented studies in the arena of CBTE will most likely take the form of *natural* field experiments; that is, systematic comparisons of desired variations that can be identified in already established programs.[4]

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[4] By recognizing the characteristics of policy-oriented studies, policy makers should be understanding of why research of this kind has not been carried out in the past and why it is possible only now to begin it: until now CBTE programs have not existed at a level of operation that enabled meaningful comparative research to be carried out! Considering the relatively brief history of the idea of CBTE, and the relative absence of funds to support the development and operation of CBTE programs, it is in some respects remarkable that development has proceeded to the point where comparative research is even now possible.

CBTE/Non-CBTE Studies

The most critically needed policy-oriented studies involve the comparison of CBTE and non-CBTE programs. Because there are major differences within both approaches to teacher preparation, however, and these differences may be as significant in terms of cost/benefit relationships as the differences between such programs, policy-oriented studies of this kind must include a sampling of the major variations that appear within both CBTE and non-CBTE programs. On the CBTE side, this would probably involve the selection of programs that focus instruction primarily at the level of knowledge mastery, skill mastery, and the ability to perform the job of a teacher in a school setting.[5] On the non-CBTE side it would probably involve the selection of programs that reflect the classic, discipline-centered four-year undergraduate approach to teacher education, the *phenomenological* approach to teacher education, and perhaps the Master of Arts (MAT) or the Teacher Corps approach to teacher education. These variations in CBTE and non-CBTE program designs are shown schematically in Table 1.

While comparative studies of CBTE and non-CBTE programs are critically needed, implementing such studies is likely to be fraught with problems. The matter of defining and then finding *pure cases* of either CBTE or non-CBTE program variations, for example, is likely to be a major stumbling block. So too is obtaining comparable outcome measures for all teachers or prospective teachers taking part in such studies, or being able to isolate and control factors that will act as sources of unwanted variation, for example, major personality, background or ability differences in teachers. Finally, there are the related problems of collecting data for and carrying out analyses on cost-benefit relationships. Methodology in this arena is primitive, and experience in applying the methodology that does exist is hard to come by.

Dominant Variations In CBTE Programs			Dominant Variations In Non-CBTE Programs		
Knowledge-Centered Definition of Competency	Skill-Centered Definition of Competency	Job Performance Centered Definition of Competency	Classic Four-Year Undergraduate Approach	Phenomenological Four-Year Undergraduate Approach	MAT or Teacher Corps Approach

Table 1. Variations that need to be taken into account when comparing CBTE and non-CBTE programs.

Given the problems likely to be encountered in such studies, their design is likely to assume some special characteristics. One of these is a small number of cases in each cell, possibly only three to five. Another is the limitation of such studies, at least during the next few years, to elementary teacher preparation programs, for it is doubtful that there are enough CBTE programs at the secondary level to permit a design requirement of even three programs per cell to be met.

Still another characteristic of CBTE/Non-CBTE studies is the high cost of carrying them out. Field-based follow-up research is an expensive enterprise, particularly so where the

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[5] According to Turner's criteria for classifying the focus of CBTE programs (Turner, 1972), knowledge-centered programs focus at level six; skill-centered programs at levels five, four, or three; and job performance-centered programs at levels two or one.

Table 2. Dependent Measures, Sources of Variation to be Controlled and Cost-Benefit Data To Be Collected In A CBTE/non-CBTE Comparative Research Design

DEPENDENT MEASURES

Short Term

MEASURES OF TEACHING EFFECTIVENESS: Job performance measures of the kind employed by Oregon College of Education in their assessment of competency in *short term* (2-5 days) or *extended* (2-5 weeks) full-responsibility teaching (these measures include data on the ability of a teacher to bring about desired learning outcomes and attitudinal changes in pupils).

MEASURES OF SPECIFIC TEACHING BEHAVIORS OR SKILLS, IF DESIRED

MEASURES OF ATTITUDES TOWARD TEACHING AND THE PROFESSION OF EDUCATION

Long Term

MEASURES OF TEACHING EFFECTIVENESS: Job performance measures of the kind employed by Oregon College of Education in their assessment of competency in *long term* (2-5 months) or *continuing* (2-5 years) full-responsibility teaching (these measures include data on pupil behavior, attitudes and learning gains).

MEASURES OF SPECIFIC TEACHING BEHAVIORS OR SKILLS IF DESIRED

MEASURES OF ATTITUDES TOWARD TEACHING AND THE PROFESSION OF EDUCATION

MEASURES OF PERSONAL GROWTH AND SATISFACTION

COST DATA TO BE COLLECTED

- Instructional costs
- Competency assessment costs
- Program assessment and redesign costs
- Program management costs
- Program governance costs

BENEFIT DATA TO BE COLLECTED

Short Term

- For preparatory or beginning teachers
- For school supervisors
- For cooperating schools and school districts as a whole
- For college faculty and supervisors
- For the teaching profession as a whole

Long Term

- For preparatory or beginning teachers
- For school supervisors
- For cooperating schools and school districts as a whole
- For college faculty and supervisors
- For the teaching profession as a whole

SOURCES OF VARIATION TO BE CONTROLLED

- Match between program design, program operation and definitional criteria
- Number of students graduated through the program
- Level of preparation offered by the program, e.g., preparation for elementary teaching
- Kind of institution within which the program rests, e.g., private small college, private large university, public small college, public large university
- Geographic location

collection of high-quality job performance data for a large number of subjects is involved (an initial sample of 100 teachers from each program represented in the study would probably be required in order to complete a five-year follow-up study with an N of any size).

In combination, these considerations lead to the conclusion that cost-benefit studies which have consequence for broad policy decisions about CBTE will probably have to be done on a nation-wide scale. Resource and program access requirements leave little alternative. So far as can be determined, no such study is being planned and, with the exception of a study group assembled by AACTE, is not even being considered. Preliminary thinking about the design of such a study is summarized in Table 2.

CBTE Program Variation Studies

Studies of this kind represent an elaboration of the CBTE portion of the design described above. In the design proposed for the comparison of CBTE and non-CBTE programs, it was recommended that CBTE programs vary by level of competency definition. The CBTE Program Variation design calls for this kind of differentiation to be carried one step further and explore within level differences as well.

The costs and benefits of at least two kinds of within-level differences in CBTE programs need to be explored. One of these differences has to do with the content or substance of a program. It is possible for two programs, for example, to define *teaching competence* essentially in terms of skills or behaviors to be performed, but in so doing, stress totally different sets of behaviors. The consequences of such differences should be known.

The other has to do with the structure and operation of a program. It is possible for two programs to stress essentially the same content but provide quite different learning experiences on the way to mastering that content. A case in point is the use of individualized learning *modules* as opposed to lecture, reading and class discussion as a means of knowledge acquisition. Another is the use of micro-teaching or some other form of *simulated* practice experience as opposed to field placement and supervision as a means to skill acquisition. Since such differences have major consequences for program cost, they need to be studied for their cost-benefit relationships.

Operationally, carrying out studies that represent the CBTE Program Variations design requires that the same conditions be met as needed to carry out studies representing the CBTE/Non-CBTE design. Mature CBTE programs of varying foci and emphases must be available; people in these programs must be willing to engage in a comparative study; the same unwanted sources of variation must be controlled; the same kind of dependent measures must be taken; and the same kinds of program cost and benefit analyses must be made. The fundamental distinction between the two designs is in the kind of program differences that get tested: in one, the difference is between CBTE and non-CBTE program variations of a very general nature; in the other, the difference is between CBTE program variations of a more specific nature, but still not so specific as to cast them as PRACTICE-ORIENTED studies (see pp. 9 to 13).

Another important difference between the two designs that have been proposed is that many individual institutions have the resources and capabilities needed to carry out Program Variations studied while few are able to manage--for political and financial reasons--CBTE/non-CBTE studies.

Unfortunately, given the relatively limited development of CBTE programs nationally, it is likely that the CBTE Program Variations design will be applicable in the foreseeable future only to programs that define competence at the knowledge and skill levels. There simply are not enough CBTE programs now operating that define competence at the job performance level to permit the comparison of the effects of alternative program emphases to be meaningful.

PART III: PRACTICE-ORIENTED STUDIES

While policy makers need the kind of information alluded to above, persons responsible for the development and implementation of CBTE programs need a different kind of information. Obviously, they must also be concerned with cost and benefit questions, but the central focus of program developers and managers is the effectiveness of alternative instructional programs and procedures in bringing about a specified set of learning outcomes. Without such information, decisions as to program design and operation must also be based on something other than fact.

As used in the present paper, practice-oriented studies are designed to bring about such information. Generally speaking, the design of practice-oriented studies is much like the design of CBTE program variations studies. They differ, however, in several important ways:

- First, practice-oriented studies are designed to test the cost-effectiveness of two or more instructional programs in bringing about a particular learning outcome;
- Second, they require more careful control over unwanted sources of variation than program variation designs because the effects to be tested are more sharply targeted (the rifle vs. shot-gun analogy); and
- Third, they do not require for their conduct full-blown, fully operational CBTE programs.

These differences in turn have two major consequences for the conduct of such studies: (a) the resources required are such that individual instructors or individual institutions can carry them out; and (b) the constraints on program operation due to the demand for control over unwanted sources of variation are such that they cause persons or programs to back away from such studies, or the aspects of programs to be researched are so limited in scope that little of practical importance comes from them. These features of practice-oriented studies need to be fully appreciated before individuals or institutions go too far in committing themselves to engage in such research.

As in the case of policy-oriented studies, two conditions must be obtained before practice-oriented studies can be implemented. First, programs must be in operation which reflect the practice(s) of concern. Second, either programs must be found that are comparable in structure, organization and student body and that are willing to compare alternative practices under experiemental conditions. Given these conditions, practice-oriented studies typically assume the form of *systematically manipulated* field experiments, in contrast to the *natural* field experiments that characterize policy-oriented studies.

Intra-Institutional Studies

Since program practices and procedures work their effects through interaction with learner characteristics and kind of learning outcome desired (see p. 19 for a model of instruction that portrays this interaction), it is probably best to carry out most practice-oriented studies within the context of a particular program or institution. There are advantages and disadvantages to this strategy however. On the positive side, it permits a researcher to more easily control the many sources of unwanted variation in such studies, for example, major differences in learner characteristics and the conditions under which an instructional practice is administered. On the negative side, it reduces the generalizability of findings. Given the rule, however, that practice-oriented studies should be replicated in at least three contexts before treating the data on effects as trustworthy, the advantages gained from carrying out such studies within the context of particular programs or institutions outweigh the disadvantages.

This should not lure individual researchers or institutions into thinking that practice-oriented studies are therefore easy to manage or without consequence to program operation. Just the opposite is the case. They require a willingness on the part of students, faculty and administrators to engage in systematically designed program variations while keeping constant the learning outcomes desired from the program; they require that bone fide experimental and control groups be established and managed in such a way that true treatment variations are in fact implemented; and they require that a reasonably large number of students be enrolled in a program in order to establish the experimental and control groups needed. Finally, they require that measures of learning outcomes of the highest quality be obtained, and that both cost and benefit data be collected and submitted to analysis. These are not easy conditions to achieve, but unless they are, practice-oriented studies would be better left undone.

Practice-oriented studies have few bounds as to the kind of practice that is appropriate to be tested. They may deal with the relative cost and effectiveness of competing instructional modules in bringing about mastery of a particular concept or a particular skill; they may deal with the relative cost and effectiveness of supervised micro-teaching as opposed to supervised in-classroom teaching in bringing about a particular set of skills or the demonstrated ability to perform a particular teaching function; or they may deal with alternative sets of procedures designed to bring about understanding of self as teacher. The only limits to be placed on practices to be tested would seem to be those of size and significance: if a practice is so circumscribed as to not warrant the effort of a serious study of its effects, or if it is so large that it is best treated as a program variation, then it probably should not be submitted to a formal test of effects within the context of practice-oriented research. Extremely circumscribed *practices* would probably be treated better within the context of basic research, and extremely global *practices* within the context of policy research.

Another characteristic of practice-oriented studies is their variability in design. While they must always involve at least two competing instructional conditions, and one or more commonly agreed to measure(s) of desired learning outcomes, they can involve all possible combinations of experimental and control groupings and before-after treatment patterns of measurement. They can also vary as to the number and kind of moderator variables to be controlled. Data can be taken, for example, only on such standard variables as age, sex, socioeconomic status and teaching experience, or extended to include measures on variables such as personality characteristics and the characteristics of the setting in which instruction occurs. It is in the province of the researcher, of course, to move a so-called moderator variable to the status of an experimental variable; and *block* his experimental and control groups accordingly. The design of the recently popular trait-treatment interaction studies is a case in point.

Given the range of options possible with respect to both the focus and design of practice-oriented studies, the suggestions offered in Table 2 as to the kind of criteria or dependent measures that could be used in such studies, the sources of variation to be controlled in them, and the dimensions of cost and benefit data to be collected and analyzed must be viewed as illustrative only.

Although the conduct of practice-oriented studies of the kind being called for are not totally foreign to teacher educators, Peck and Tucker (1973) point out in their recent summary of the research on teacher education that the vast majority of such studies have occurred within the past ten years. They have also taken place in relatively few locations and, apparently, have had little influence on the manner in which teacher preparation programs across the nation are structured and operated.

It is likely that two conditions account for this circumstance. First, experimental studies in teacher education have tended to be carried out in contexts that could tolerate the control and manipulation they require. The best example of such a context is an instructor's

Table 3. Dependent Measures, Sources of Variation To Be Controlled, And Cost-Benefit Data To Be Collected In Practice-Oriented Studies

DEPENDENT MEASURES

	Short Term	Long Term
MEASURES OF DESIRED LEARNING OUTCOMES:	Whatever measures of knowledge, skill mastery, attitudinal change or the ability to perform the functions of teaching that a particular program has adopted as the criterion for exit from the element of the program being tested.	Probably none, though this will depend on the program element being tested. If the learning outcomes of a particular program element are expected to be traceable in a full-time teaching situation, researcher may want to include long term measures.
REACTIONS TO THE PROGRAM ELEMENT:	Whatever measures of interest, meaningfulness, acceptability, time requirements, resource requirements, etc. that are of interest.	

COST DATA TO BE COLLECTED

- Instructional costs
- Learning outcome assessment costs
- Program management costs
- Program governance costs

BENEFIT DATA TO BE COLLECTED

Short Term	Long Term
. For preparatory or beginning teachers	. For preparatory or beginning teachers
. For school supervisors	. For school supervisors
. For cooperating schools and school district as a whole	. For cooperating schools and school district as a whole
. For college faculty and supervisors	. For college faculty and supervisors
. For a college as a whole	. For a college as a whole
. For the teaching profession as a whole	. For the teaching profession as a whole

SOURCES OF VARIATION TO BE CONTROLLED

- Initial differences in treatment groups
- Unwanted variation in treatment conditions
- Lack of equivalent contexts for outcome measurement

own class. Second, it has tended to involve practices that are narrowly conceived or limited in scope, for example, practices that cover a day or a week of instruction, a particular grading practice or a particular set of role relationships between instructor and student that are to be tried for a term. Both strategies seem to stem from the fact that practice-oriented studies make severe demands on the control of unwanted sources of variation, in both treatment conditions and outcome measures. The consequence of employing such strategies has been results of limited utility and generalizability, even within the context where the studies are carried out.

These are problems that have plagued educational researchers for decades, and only now are we coming to understand what must be done to overcome them. Basically they are problems that have to do with the external validity of educational experiments (Bract and Glass, 1968; Snow, 1974). Schulman speaks to such problems pointedly when he says:

> Researchers are caught in a bind. To maximize the internal validity of experiments, they develop carefully monitored settings within which they can govern their research. This has long been recognized as a necessity, but it is likely that the experimental tradition in American education over-emphasized the importance of reliability and precision at the expense of the characteristics affecting that other factor of equal importance (external validity) . . . It is not sufficient that the individuals studied as a sample are truly representative of that human population to which the results must also ascertain that the experimental conditions can serve external conditions of interest. That is, researchers must also attempt of maximize the similarity between the conditions in which they study behavior and those other conditions, whatever they may be, to which researchers may ultimately wish to make inferences. The similarity should hold between psychologically meaningful features of the settings, not merely between the manifest aspects of the two situations. (1970, p. 377)

If Shulman's analysis is correct, three fundamental shifts in the nature and focus of educational research must take place if it is to be responsive to the criterion of external validity: (a) a shift in emphasis from the sampling of people to the sampling of educational environments; (b) a shift from the study of single, isolated variables to the study of the complex of variables that make up ongoing educational environments; and (c) a shift from piecemeal, unrelated, *one shot* research efforts to studies that are articulated through time, theory, and problem focus.

It is the contention of those who have prepared the present document that CBTE programs provide the kind of contexts where such shifts for the first time have some hope of coming about. Descriptions of two such contexts, and the research programs that are projected within them, are provided in PART VI of the document.

Having said all of the above it is important to point once more to the fact that the conduct of long-term, multi-faceted, contextually valid, experimental research lays heavy demands on an ongoing educational context, and unless the context is special in many ways, such demands will not be met. In the judgment of the committee at least five conditions must prevail:

- Persons responsible for the management and operation of the program must be inclined toward experimentation. Commitment to empiricism and the desire to know must be dominant features of the context. Research must be viewed as an integral part of program operation, and as such viewed as a continuous, necessary and desirable part of the program.

- Persons responsible for the management and operation of the education program must view it as subject to continuous change, and view as a major data source for its change a systematically designed program of research on its effectiveness. When viewed in this way, research can have both the immediate and applied value that it needs to be supported by those responsible for program operation.

- Data of a quality that will support trustworthy research must be collected as a normal part of program operation. Accurate, reliable descriptions of program operations must be provided and accurate, reliable measures of learning outcomes must be recorded as a matter of course.

- Sophisticated data management, storage, retrieval and display capabilities must be available. Data to be used for research, program operation and program adaptation purposes must be routinely stored on computers and routinely retrieved in formats that support program related decisions making and research.

- There must be an advisory structure to insure that the research pursued has value to persons in the program as well as to the profession at large.

It is recognized that these five conditions represent an unusual array of features to find in any ongoing educational context today. It is also recognized that they are difficult conditions to bring about if they are not already in existence. It is the judgment of the CBE Centers research committee, however, that CBTE programs represent the most hopeful development in the history of education for such conditions to be met.

Inter-Institutional Studies

While most practice-oriented studies will be carried out within a particular institution, at least initially, the continuing concern for the utility and generalizability of the results of such studies requires that they be replicated ultimately in a variety of educational contexts. To some extent this requirement can be met by testing a particular practice in different programs, or with different populations of students within a single program. In the long run, however, this is not sufficient; for until it can be shown that a particular practice is successful in a number of institutions, it is not likely that it will have a great deal of acceptance in or utility to teacher education at large.

In carrying out inter-institutional studies on alternative practices, it will be necessary, of course, to use the same kind of dependent measures, to control for the same sources of variation, and to collect the same kind of data on costs and benefits as collected in intra-institutional studies.

PART IV. BASIC RESEARCH STUDIES

The logic behind and the immediate payoff from both policy- and practice-oriented studies are apparent to most teacher educators. This is not the case for basic research studies. In fact, there is often open hostility on the part of both educators and teacher educators toward research activities labeled as *basic*. While understandable, this is an unfortunate circumstance, for like it or not the kind of research activities that typically get classified as basic are at the center of how members of a particular profession think, work, and extend the knowledge base of their profession.

Notes on Terminology

While the distinction between basic and applied research has never been particularly clear (Cohen, 1948; National Science foundation, 1960; Brooks, 1967), the distinction has been maintained for purposes of the present paper. As used here the concept of basic research is essentially a catch-all category to describe research activities that cannot be classified as either policy- or practice-oriented (applied) studies. Typically such studies deal with matters that have little direct utility to the educational practitioner. Most commonly they deal with variables affecting instruction, rather than with full-blown features or aspects of an instructional program. Because of this, they tend to be linked more closely to the development and testing of instruction-related theory than they are to the development and testing of instructional programs and procedures.

As a consequence, educational practitioners tend to find the results of basic research to be of little direct utility and, as a by-product, of little interest; persons concerned with the development of instructional theory, however, or persons attempting to carry out practice-oriented research, find the results of basic studies to be essential to their work.

The distinguishing features of policy-oriented studies, practice-oriented studies and basic research studies, as these are treated in the present document, are summarized in Table 4.[6]

Notes on CBTE Programs As Contexts For Basic Research In Education And Teacher Education

Historically research in education and teacher education has been disappointing (Gage, 1963a; Smith, 1972; Travers, 1973). A host of explanations have been offered for this fact, including the argument that the world of education is simply too complex to yield to the strategies of science. In the judgment of the committee, however, two interdependent factors offer a more plausable explanation:

> the failure to devise experiments that meet the requirements of external validity (see pp. 11 to 13); and

[6] Survey research is another class of research activity frequently engaged in by educators, but because of its relative simplicity it has not been dealt with. Obviously, surveys can produce information that is of considerable use to educational practitioners, particularly if they supplement information gained through policy- and practice-oriented studies.

the failure to devise measures of dependent or outcome variables that are conceptually consistent with the learning outcomes intended from a treatment condition, and at the same time feasible to apply and meaningful to those who are to use them or benefit from their use.

The rationale for this point of view is straightforward. No matter how powerful a research design, a weak or unimportant treatment condition will never give rise to research results of practical significance (the external validity problem). But what is more important, even when a strong or important treatment condition is combined with a powerful design, research results of practical significance will never be obtained unless the measure of effect is strong (the dependent or outcome measure problem).

Table 4. Features that distinguish policy-oriented, practice-oriented and basic research studies in teacher education

Type of Study	Experimental or *Treatment* Variables	Dependent or *Outcome* Variables	Control Over Unwanted Sources Of Variation	Collection of Cost-Benefit Data
POLICY-ORIENTED STUDIES	Teacher Education programs or elements of such programs	Short- and long-term measures of success as a teacher	Loose	Yes
PRACTICE-ORIENTED STUDIES	Instructional units or sequences (modules) within programs that are designed to bring about specified learning outcomes	Intended and unintended effects of the instructional unit being tested	Moderate	Yes
BASIC RESEARCH STUDIES	Practices, procedures or variables assumed to be related to learning and instruction	Performance on a conceptually relevant measure of learning effects	Tight	No

One of the most hopeful features of the competency based-education and teacher education movements is that, as envisioned, they should do much to overcome these two problems. If carried to successful completion, they should provide better defined and more powerful treatment conditions and better defined and more powerful measures of learning outcomes in teachers and pupils. If these contributions of CBE and CBTE are of the kind and quality anticipated, and if the research community recognizes them as such and takes advantage of their availability, basic research--as well policy-oriented and practice-oriented research--in education and teacher education should profit immensely.

Two additional conditions must be met, however, if competency-based education and teacher education programs are to become functional contexts for basic research. First, as implied above, the measures employed in the assessment of desired learning outcomes in pupils and teachers must be of a quality that permits their use in research. That is, they must be valid, reliable and sensitive. Second, experimental designs must be employed with sufficient rigor that *causality* can be attributed to the experimental or treatment variables being investigated. Both of these conditions are above and beyond the requirements of normal program operation, either in schools or in teacher education institutions, but there is reason to believe that both can be achieved if introduced with care and foresight. When these conditions are met, much is to be gained, for basic research can be carried out as an adjunct to the normal operation of educational programs at little added cost!

While it is possible to combine basic research with program operation by meeting these two conditions, it needs to be pointed out that considerable risk is involved in attempting such a venture. High quality measures, for example, are often difficult and costly to obtain. Also, requiring that program operations meet the constraints of experimental design almost always creates a cumbersomeness and rigidity that frustrates program managers and participants. Heretofore, efforts to design data collection systems that support both program operation and basic research have tended to end in the design of research programs instead of operational programs that have good data. When this has occurred there has been a nearly universal reaction on the part of program managers and participants: throw the researchers out! (Parlett and Hamilton, 1972).

Recognizing this pitfall, it should still be possible to design data generation systems that will support both program operation and basic research. When this is the case, the best possible context for basic research exists: it can be carried out at low cost and it has a good chance of meeting the requirements of external validity that are not met in most educational experiments.

Four Categories Of Basic Research Studies In Education And Teacher Education That Need Particular Attention

No effort will be made in the present paper to deal with the full range of research activities that are typically labeled *basic*. Instead, four of the most representative of basic research activities, and in the committee's judgment four of the most critically needed research activities for the long-term betterment of education and teacher education, have been selected for discussion. These have been labeled:

- construct delineation studies;
- instrumentation studies;
- principle identification studies; and
- model testing studies.

While the language used to label these four broad categories of research activity may be unfamiliar to some, the research activities to which they apply are commonplace in the physical, biological and behavioral sciences, and are widespread in most knowledge-based enterprise of man, for they constitute the means by which the basic concepts, principles and methodologies of a discipline or profession are fashioned.

Unfortunately, they are not commonplace research activities in education. It is the view of the CBE Centers research committee, however, that they must become so if the profession of education ever is to do well what it has been asked to do.

Before proceeding to discuss these various categories of research activity, two comments need to be made about the interdependence of basic research in education and teacher education. The first has to do with the need to distinguish sharply between learning and teaching or instruction. As strange as it may seem, this is a distinction that largely has been ignored by educational and psychological researchers in the past (Gage, 1963b), but one that in recent years has begun to bear fruit (Hosford, 1973; Nuthall and Snook, 1973; McNeil and Popham, 1973). As used in the present paper, theories of learning deal with how an individual takes in, stores, transforms and utilizes information; theories of teaching or instruction deal with how an individual influences that process. In drawing this distinction elsewhere, Schalock has pointed out that

> In a sense the distinction is arbitrary, for the end point of both is learning. In another sense, however, it is not, for the focus of one is upon the process of learning and the other upon the conditions of learning. By forcing the distinction, and then attending systematically to the conditions of learning (instruction), issues that tend to be obscured when focusing upon learning, come into full view; for example, the dependence of instructional decisions upon educational objectives and learner characteristics. In their pursuit of laws governing learning, experimental psychologists have not attended systematically to either of these classes of information . . . The assumption underlying the present effort is that by high-lighting the instructional process, and by attending to it both conceptually and empirically, it will be possible in time to develop a productive science of instruction which, in turn, will permit an effective and efficient technology of instruction. (1972, p. 39)

The position being taken in the present paper is that educators and teacher educators should focus their basic research efforts on instruction and let psychologists continue to focus their efforts on learning.

The second comment grows from the first: that is, when tested concepts and principles pertaining to instruction emerge from basic research activities, they are equally applicable to teachers and teacher educators. Teachers need access to ever more powerful concepts and principles to guide their instructional activities with pupils. Teacher educators need access to the same information, but for two reasons: it is information that needs to be conveyed to prospective or experienced teachers so that they may use it in future, and it is information that needs to be taken into account in designing instructional activities when teaching prospective or experienced teachers. From this point of view the design of basic research studies on instruction (as distinct from learning) should not vary greatly when carried out by educators or teacher educators. The subjects taking part in a study will probably vary (e.g., college as opposed to elementary school students), and as a consequence, treatment conditions and measures will vary, but the fundamental nature and function of such studies will be the same, namely, the identification or sharpening of concepts, principles, models and methods that can be brought to the process of instruction wherever and whenever it occurs.

Construct Delineation Studies[7]

An essential feature of any discipline or profession is the development, extension and refinement of its constructs, for it is through its constructs that it gains its power.[8] Conceptualization (the building of constructs) is a constant, cyclical, data-dependent process wherein new data (observations) give rise to new constructs and new constructs give rise to new data. The cycle does not begin at a particular place, nor end; it is ever present and so long as man inquires, it will forever be present.

The point that is critical here is that constructs do not *just happen* or do not *first exist*. They are man-made and they are constantly evolving. For ages, man disregarded certain objects or their effects because he did not know of them or their behavior. He did not notice, for example, ultraviolet radiation nor the fact that quartz reacted differently from glass to ultraviolet light. Nor did he notice electrical currents in the brain, or *unconscious* motivation, or that some people can taste certain things and others cannot. We now have such constructs, and they have lead to an appreciable store of knowledge. We do not have them in the same form as they were conceived initially, however. Atomic structure, circa 1974, is not atomic structure circa 1938. Neither is *intelligence* nor *motivation* nor *learning*. Constructs come and go, may be powerful or weak, but always they change. Moreover, whatever their form, they dictate what is to be observed and measured.

As indicated previously, constructs that are central to instruction (in contrast to learning) have only begun to be specified and systematically researched. With the exception of Bruner (1966), and more recently Hosford (1973) and Dunkin and Biddle (1974), no theories or models of instruction (in contrast to theories or models of learning) have been seriously put forth to be tested. As a consequence, construct delineation studies in education and teacher education have a relatively weak conceptual and empirical base from which to begin.[9]

Ideally, construct delineation studies are guided by a reasonably well-specified conceptual framework. Such a framework is used both as a source of constructs and as a guide to how the various constructs being tested relate to one another. Without wishing to become embroiled in the paradigm-model-theory debate (Brodbeck, 1963; Gage, 1963b; Snow, 1973), an illustration of such a framework that applies to instruction is presented as Figure 1.[10]

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[7]The content of this section of the paper draws heavily from two previous publications by the author, a chapter on *Measurement* in The National Research Training Institute Manual, Monmouth, Oregon: Teaching Research, A Division of the Oregon State System of Higher Education, (1969) and a chapter on *Learner Outcomes, Learning Processes and the Conditions of Learning* in The Contribution of the Behavioral Sciences to Instructional Technology: The Cognitive Domain (A Resource Book for Media Specialists), Washington, D. C.: Gryphon House, 1972.

[8]Constructs are concepts which have the added meaning of being deliberately or consciously created for a special scientific purpose. Intelligence is a case in point.

[9]It could be argued that persons like Skinner (1954, 1968) and Gagne' (1965, 1970), who are identified primarily as psychologists concerned with learning, have in fact put forth theories of instruction. In these two instances, this is probably the case. It is not the case, however, for most psychologists working in the area of human learning.

[10]Whether the framework is a model, a paradigm, or a first cut at a C or D-Theory is unclear. What is clear are the directional implications of the framework for research on instruction. Since these directional implications are immodestly seen as . . . . *defining the legitimate problems and methods of a research field for succeeding generations of practitioners* (Kuh, 1962, p. 10), the framework could, with equal immodesty, be referred to as a paradigm.

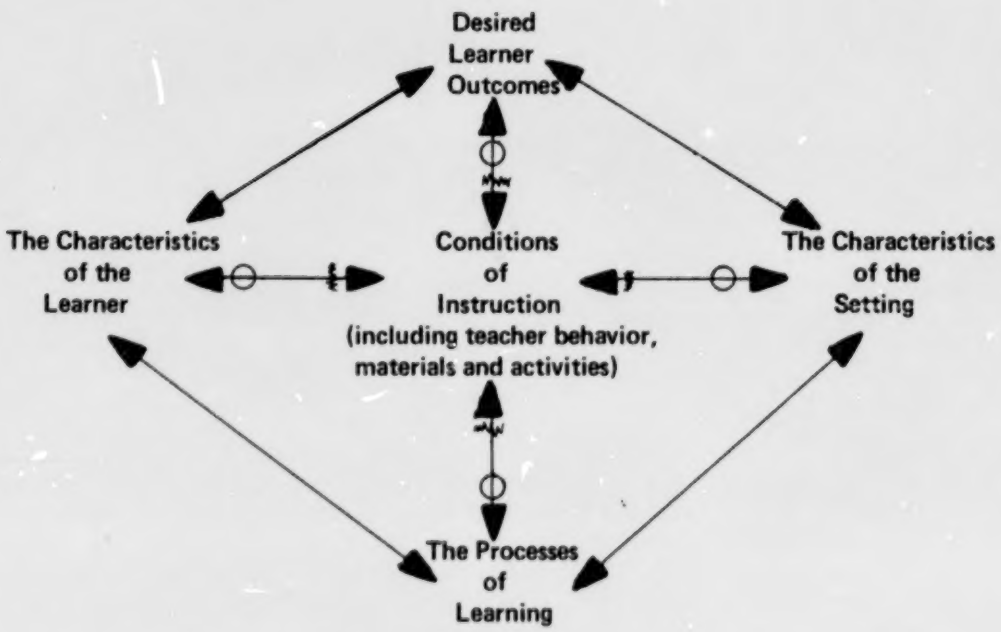


Figure 1. The factors that need to be considered in establishing effective conditions of instruction at a particular point in time (the circles on the arrowed lines represent learner behavior and the squiggles represent the filtering effect of teacher characteristics on the perception of learner behavior and the other factors affecting learning).

Three comments need to be made about the paradigm. First, the paradigm can be described best as a *context dependent* paradigm, for it is based on the assumption that, for instruction to be effective, what a teacher does must always be adjusted to the nature of the learning outcome(s) desired, to the nature of the learner(s) being taught, and to the nature of the setting within which learning-teaching is occurring--as well as whatever is known about how learning occurs. As such, effective teaching is seen as representing an articulation of a remarkable number of variables, especially when a wide variety of learning outcomes are being pursued by a wide variety of learners under a wide variety of learning conditions. While this is not inconsistent with how instruction is viewed generally, it is inconsistent with how most research on instruction has been done.

Second, the paradigm has strong directional implications for research on instruction. It specifies the major classes of variables to be attended to in such research, and it specifies that these variables be treated in designs that accommodate them as interdependent or *contextually dependent*.

Finally, it lends perspective to the anxiety which many educators feel about the continued emphasis in CBTE on teacher behaviors, and the continued press to carry out research that attempts to link teacher behavior to pupil outcomes (see articles by Rosner and Kay, McDonald, and Flanders in the January, 1974 issue of the Phi Delta Kappan as examples of the continued press for such research). Within the proposed paradigm, teacher behavior may be treated as either a dependent or an independent variable; when it is treated as an independent variable it must be done so within a design that links it to student characteristics, setting characteristics, class or learning outcome pursued, and the learning processes involved in the mastery of such outcomes.

Within such a framework, the continued search for simple correlations between teacher behaviors and learning outcomes in children does not carry much appeal. Nor does it carry much hope, considering the near infinite array of permutations possible between particular behaviors, particular learnings, particular learning outcomes, particular teachers, etc. The conclusions reached by Rosenshine and Furst (1971), therefore, should not be surprising. Nor should the kind of criticism that Maxwell has recently leveled at persons responsible for the design of CBTE programs who continue to define teacher competency in terms of specific teacher behaviors:

> We don't have a list of the competencies of the successful teacher for the simple reason that teaching is an art--not a science. Behavior that is a valuable asset to a given teacher with a certain personality in many (but not all) situations, insofar as most (but not all) of his pupils are concerned, may well go over like a lead balloon (to most students) if affected by some other teacher with a different personality. We can't even say that a teacher should love his students, since many teachers that we and the students consider successful exhibit no behavior (measurable or otherwise) that would lead one to this conclusion.
>
> The teacher/student relationship is one characterized by heterogeneity on both sides of the relationship. The art lies in knowing, or sensing, what particular stimulus or behavior is best for me as an individual teacher to reach most effectively a particular student or group of students in a given set of circumstances. To assert that the *competent* teacher *will demonstrate his concern for persons in the lower socio-economic groups by voluntarily spending at least two hours per week working in a social agency* is absurd, no matter how highly we value such concern or approve of such work. We can make no such simple statement about the competeny teacher. (1974, p. 310)

In order to carry out research on instruction that meets the requirements of the paradigm outlined above, it is necessary to define, establish the parameters of, and make operational the major variables contained within it. The research and development involved in this process is perhaps the most basic of all activities that goes on in any science. It is a highly conceptual activity; it involves basic methodological work in that constructs must carry operational definitions and be subject to measurement in order to be incorporated into a research program; and it involves a major empirical effort in order to determine whether the constructs identified are sufficiently powerful to warrant inclusion in research on the paradigm proper. In its more advanced stages it is also likely to involve theory testing, since any set of constructs take their definition within a theoretical system of one kind or another.

For all these reasons it is proposed that construct identification studies be considered as a necessary part of any basic research program on instruction, and that it be seen as paralleling or preceeding the other categories of basic research on instruction that are being proposed.

The design of construct identification and delineation studies assumes two basic forms. The first is a classic, single variable or comparative research design in which the purpose is to determine whether a particular construct has any identifiable impact upon learning

outcomes in children, or if it has any likelihood of such impact even though there is no empirical evidence to that effect. Research of this kind is always guided by the paradigm that reflects the particular view of instruction that is being researched, for example, an *inquiry* or a *precision* approach to instruction. The specific purpose of such research is to define, within the broad classes of variables identified within Figure 1, specific variables that are promising for inclusion in the next level of research, that is, research that seeks to establish laws or principles.

A second research design that is a necessary feature of construct identification and delineation studies is a *testing of methodology* design. When new constructs are identified, or when existing constructs are refined, a set of measurement operations have to be developed in order to test the power of the constructs. Since the results of any research study are as good only as the measures of the constructs employed within it, the development of strong measures for all constructs to be investigated becomes a critically important activity. Central in this activity are comparative studies of the power or effectiveness of alternative approaches to measuring a particular construct. Because of the importance and complexity of this kind of research, and because it borders upon and at times becomes synonymous with the reliability and validity studies that must be carried out as a part of instrumentation, it is treated for purposes of the present paper as a separate category of research.

In closing the discussion of construct identification-delineation studies, four observations seem appropriate. First, studies of this kind do not need to *start from scratch*. Large literatures exist with respect to at least four of the five clusters of variables identified in Figure 2, and a literature is beginning to emerge in relation to the fifth. Second, research of this kind has not and need not be carried out only by educational researchers. Biologists, psychologists, anthropologists, and sociologists are all involved in the identification and delineation of constructs that contribute to the conceptual structure called for by the paradigm. Third, the process of construct identification and delineation is laborious, complex and time consuming. It is also never-ending, for implicit in the philosophy of science is the assumption that constructs will never cease to evolve nor will they ever find their absolute definition. In this context it is probably safe to say that the professional life-times of dozens of researchers will be needed on each of the classes of variables identified in Figure 2 before constructs will surface that are sufficiently powerful to permit research in education to proceed with the hopefulness of difference-making that research carries in the basic sciences.

Finally, the same reasons that make CBTE contexts so desirable for carrying out practice-oriented studies are the same reasons that make them so attractive for construct identification-delineation studies. It is a stable, continuously available research context; many of the data needed for such research are available as a consequence of normal program operation, thus making it a low-cost research context; and the variables being investigated are the real-life variables with which teacher educators and educators must deal. Stability, accessibility, low-cost, and the likelihood of being able to overcome the problem of the external validity of experiments constitute much of the value to be gained.

Instrumentation Studies

As indicated above, a construct takes its meaning through the operations used in its measurement, as a consequence, the development activities involved in creating and refining measures of constructs is what is referred to here as instrumentation studies.

The development of good measuring instruments is a complex and demanding process, and one that requires the application of relatively unique research procedures. The various forms of item analysis, reliability testing and validity testing in relation to norm-referenced measures is a case in point (Thorndike, 1971; Campbell and Fiske, 1959; Cronback and Meehl, 1955).

Still different research procedures are needed when developing criterion-referenced measures, observational measures, and situational-response measures. It is beyond the scope of the present paper to deal with these various procedures, but the reader who wishes to engage seriously in construct delineation research, or for any other reason needs to develop a particular measure or set of measures, is encouraged to refer to such classic texts as those by Lindzey (1954) and Jahoda, Duetsch and Cook (1951) as a point of departure. Schalock (1969) has summarized the advantages and disadvantages that typically accompany various approaches to measurement in education and the behavioral sciences, and the kinds of evidence needed about each kind of measure in order to have confidence in its use.

Central to the design of instrumentation studies is the matter of criterion. On what basis is the decision to be made that one approach to measurement is superior to another for a particular variable or construct? The correlation of one measure with another that is known to be a *valid* measure of the construct under consideration (the criterion used in *concurrent* validity studies) is an inappropriate strategy, for it provides no information as to which of the two measures is in fact the more powerful. In most cases, instrumentation research must move to the arena of prediction in order to obtain data on the relative power of one measure to another. As tortuous and convoluted as predictive evidence often becomes (Schalock, 1969), it is the only evidence that can be looked to with confidence in tests of the comparative power of alternative measures. Other things being equal, the measure that predicts with most accuracy or power must be viewed as the better measure.

One of the dilemmas faced by researchers in education and teacher education is the time and energy required to create sound measures. It is not uncommon, for example, to spend as much time in preparing a measure to use in a research study as is spent in carrying out the research in which it is used. In fact, it is not uncommon to devote a lifetime of research to just the development of a measure or set of measures.

While the time and energy required for the development of sound measures may be disconcerting to some, it should not cause researchers to circumvent this most important of all activities. Information coming from a substantive research effort is only as good as the measures used in the collection of that information. The *garbage in-garbage out* dictum cannot be taken lightly. To help eliminate the waste that has characterized so much of educational research, future generations of researchers are encouraged to attend to problems of instrumentation as carefully as past generations have attended to problems of design and analysis.

Principle Identification Studies

When construct delineation and methodological research has progressed to the point where reasonable confidence can be placed in one or more variables within the various classes of variables specified in Figure 2, research on the identification of instructional principles can begin. As used in the present paper, a principle of instruction is an empirically established relationship between a particular set of instructional conditions and a particular class of learning outcome for learners who have a particular set of learning-related characteristics and are working under a particular set of learning conditions. The power of such *principles* rests in the guidance they provide for instructional decision making by teachers and the designers of instructional materials and programs. If strong principles (clearly demonstrated

empirical relationships of the kind referred to above) were established, teachers and the designers of instructional materials would have a set of guidelines that could be relied upon in creating the conditions needed to bring about the desired learning outcomes. Until such empirical relationships are established, on-line instruction, as well as the design of instructional materials, must of necessity be an interactive process involving best guesses and successive approximations.

In some respects the design of research that aims toward the identification of principles of instruction is more complex than that aimed at the identification of constructs and the development of good measures, but in other respects it is less so. On the one hand, principle-related research requires the use of designs that will accommodate a larger number of sources of variation in the course of a single study than does construct-related research. On the other hand, the criterion problem is much less troublesome. The criterion of progress in relation to desired learning outcomes is straightforward and unambiguous; the criterion of predictive utility is anything but.

Be this as it may, there are designs and methods of analysis that can accommodate the complexity required by principle-related research. Prototypic in this regard are the designs and analyses used in aptitude-treatment interaction studies (Bracht, 1970), (Cronbach and Snow, 1969).

As in the case of construct related studies, a number of comments need to be made before leaving the discussion of studies aimed at establishing instructional principles. First, while studies of this kind do not need to *start from scratch*, they do not have the conceptual and empirical base enjoyed by construct-related studies. Aptitude-treatment interaction studies are prototypic, but they need to accommodate the additional variables identified in Figure 1. Second, research of this kind will probably be undertaken only by educational researchers. While biologists, psychologists, sociologists and anthropologists search for and work with many of the same constructs that need to be involved in instructional research, they will rarely search for instructional principles of the kind considered here. Third, the process of establishing instructional principles is just as laborious, complex and time-consuming as the process of delineating constructs and developing methodology. It is also as neverending. In part this is because of the interdependence of construct and principle-related studies: as better constructs are established, better principle related research can be undertaken, and as better principles of instruction emerge, sharper constructs and finer measures can be developed. In part, however, the difficulty is because of the implicit assumption in the philosophy of science that principles once established will forever be refined.

Finally, the reasons that make a CBTE context a particularly attractive context for all of the other kinds of research that have been discussed are the same reasons that make it a particularly attractive context within which to pursue research leading to the establishment of instructional principles. It is a stable, continuously available context in which the cost of carrying out research is low and the fidelity (external validity) of the variables is high. Given the likelihood of a large number of *pilot* or *exploratory* studies being performed (the frequency of false leads and wrong predictions will undoubtedly be high in the beginning) and given the requirement of a large number of replications to establish the confidence levels needed if practitioners are to rely upon the emerging principles as guides to instruction and instructional development, a research context that has CBTE-like properties would seem to be a necessary condition for the conduct of principle-related research. Whether ongoing CBTE programs can be found that will tolerate the demands placed upon them by such research, and at the same time possess staff with the competence to carry out such research, is an open question. Until such contexts are available, however, research that makes an appreciable difference in instructional design and practice is not likely to occur.

Model Testing Studies

Another research activity that is commonplace in the physical, biological and social sciences, but relatively rare in education and teacher education, is theory or model testing research. Typically this kind of research involves the testing of hypotheses derived from a well-developed conceptual framework, with the results of the test being used to validate or invalidate, refine or extend the conceptual frame. To the extent that a model or theory is useful, this is perhaps the most powerful kind of research activity in which to engage, for its long-term aim is the development of a framework that integrates a large number of concepts and principles in a way that makes prediction possible.

A number of educational philosophers and researchers have pressed for the initiation of model testing research in education (Brodbeck, 1959, 1963; Gage, 1963), but as yet few such studies have been undertaken.

One of the chief reasons for the lack of model testing studies in teacher education is the lack of well-articulated models to be tested (Snow, 1973; Nuthall and Snook, 1973). Another is that when a model of one kind or another has been tested, results generally have been disappointing. A case in point is the work of David Ryans (1960). His was a model of teacher effectiveness that spelled out a set of traits assumed to be needed for successful classroom teaching. The results of Ryans' research was on the whole disappointing, and little has been done with his model since.

This kind of history does not mean, however, that model testing studies are necessarily doomed. Interest in model building and testing seems to be on the upswing. A good example of this trend is the sociologically and psychologically based model of teacher effectiveness advanced by William Spady of NIE (1973, 1974). His model seems to be more powerful conceptually than Ryans' model, and in many respects more subject to empirical test. He proposes four characteristics that a teacher must possess to be effective: (a) have something of substance and interest to say; (b) be capable of saying it clearly and accurately; (c) be capable of saying it in a stimulating and exciting fashion; and (d) base this communication directly on a concern for the personal welfare of each student. (1973, p. 26). He then goes on to say

> . . . these four conditions or attributes can conveniently be grouped in pairs: the first two, referring to the teacher's subject matter expertise and pedagogical skills, underlie a general *expertise* dimension; the third and fourth define a *charismatic personality* dimension consisting of an exciting and inspiring, yet empathic, manner of relating to others and their personal needs.

By dividing the four dimensions into two categories, high and low, and then charting the two clusters of categories into a sixteen-cell matrix, Spady is able to lay out, in a highly schematized fashion, the attributes that he feels are needed to effect teacher legitimacy and effectiveness. His sixteen-cell table appears as Figure 2. He would predict that teachers falling in cell 1 would be most successful and those falling in cell 16 least successful.

			EXPERTISE DIMENSION			
			SUBJECT MATTER EXPERTISE			
			Low		High	
			PEDAGOGICAL EXPERTISE		PEDAGOGICAL EXPERTISE	
			Low	High	Low	High
CHARISMATIC DIMENSION						
STIMULATION, EXCITEMENT	High	EMPATHY, CONCERN High	4	3	2	1
		EMPATHY, CONCERN Low	8	7	6	5
	Low	EMPATHY, CONCERN High	12	11	10	9
		EMPATHY, CONCERN Low	16	15	14	13

Figure 2: A classification scheme for role attributes assumed to be needed to maximize teacher effectiveness.

The reason for presenting the Spady model in this much detail is to illustrate for form and content that a model might take that is appropriate to teacher education, and to show how such a model might be tested. It would be possible, for example, to assess prospective or inexperienced teachers on each of the four dimensions specified in the model, classify them according to one of the sixteen cell positions, and then test the effectiveness of teachers that are classified in the various cells. Such research assumes, of course, the existence of good measures for each of the four dimensions, and good measures of teaching effectiveness. Given these two assumptions, however, and the assumption that teachers can be found to take part in the study--assumptions that are reasonably realistic within the context of operational CBTE programs--such a study should be able to be carried out.

PART V. DOCUMENTATION STUDIES

It has been argued (see pp. 3-4) that CBTE needs to be the focus of documentary or case studies as well as basic and applied research studies. The rationale for the agreement is straightforward: (a) competency-based programs are a great deal more complex in their structure and organization than traditional programs; (b) they require for their development and implementation a level of assistance beyond that required to implement programs of a traditional kind; and (c) an extremely useful way to provide such assistance, indeed perhaps the only way, is through detailed documentation of the development and operation of existing CBTE programs.

It is the opinion of the CBE Centers' research committee that knowledge of the development and implementation process in CBTE represents as much a knowledge gap as the various other gaps that have been referred to in earlier sections of the paper.

At least three kinds of case studies are needed. One should focus on over-all program development and operation; another on aspects of CBTE programs that are particularly complex to develop and operate, or that have been particularly tardy in their development; and still another on the diffusion of program practices within an institution, or to other institutions within a state or region. Examples of the first type of study include the AACTE Monographs on Weber State (Burke, 1974) and Oregon College of Education (forthcoming), and the volume by Dickson, *et al.* on the CBTE program at the University of Toledo (1973). Examples of the second include the DeVault, *et al.* report on module development (1973) and the Schalock, *et al.* report on the development of the OCE-TR system for assessing competence in teaching (1974). An example of the third type of study appears as Appendix A.

Ideally, attention would be directed within each kind of documentation study to both developmental and operational issues, and within both of these to the critical decision points encountered, the decision alternatives considered, the decisions made, the consequences of the decisions made, and, to the extent possible, the likelihood of the consequences of alternative decisions considered.

Collectively, these various approaches to documentation would give the potential developer of CBTE programs access to knowledge which only experience can provide. They would give access, for example, to practices and procedures used to develop CBTE programs or to share programs with others once they have been developed. They would also provide a good sense of the effectiveness of such practices and procedures, at least as they have been applied within the constraints of one real-life, ongoing operational program. In short, a carefully selected set of documentation studies would provide the kind of information needed about program development, operation and diffusion that is extremely difficult to obtain in any other way, and it is information that must be available if the principles of CBTE are ever to be adopted widely.

On the basis of experience in preparing carefully documented case studies of ongoing research and development programs (Schalock, *et al.*, 1972), it is essential that the preparation of CBTE case studies be undertaken with as much planning and forethought, as much professional expertise, and as large a resource base as any of the applied research studies that have been called for. It is unclear, however, how best to actually carry out such studies. One procedure would be to contract with an agency to carry out all documentaries. This would involve the preparation of staff, the collection of data, the provision of case study reports, etc. The advantages of such a procedure, as compared to a series of independently initiated studies, are efficiency, comparability of reporting formats, and reasonably good assurance of quality. The disadvantages are the lack of first-hand familiarity with the data to be reported and the depencence on the recall of others to provide such data.

An alternative approach would be to provide only for the central coordination and management of the documentation effort at the federal level, for example, establish specifications as to substance, format, etc., and use trained staff from the institutions whose programs are to be reported as scribes or reporters of the development and implementation process as it is occurring.

Either procedure would require a considerable funding base, a great deal of preparatory and design work, access to expertise in case study preparation, and a well-designed management system to insure optimum quality at minimum costs. These are all difficult conditions to come-by, and there is danger that without a clear recognition of the complexities involved in meeting them an effort to prepare the kind of case studies called for would be disastrously underfunded and understaffed.

A by-product of the documentation studies outlines, or perhaps a companion to them, is a series of case studies that document the development and operation of CBTE programs that serve as contexts for research (for a brief description of two such contexts see PART VI of the paper). While relatively few CBTE programs will meet the criteria needed to function as research centers, it would seem to be important to include them in the over-all documentation effort. Given the promise that such centers hold for educational research, and given the nature of the relationships that must exist between instruction and research if a program is to serve as a functional research context, it would seem that documentaries of this kind would be of particular interest to an agency like NIE. Since the creation of CBTE centers for research may be to education what the creation of laboratories has been to the physical sciences, agencies like NIE should understand all they possibly can about how such centers function.

PART VI. ORGANIZING TEACHER PREPARATION PROGRAMS AS CONTEXTS FOR RESEARCH

Throughout the paper an emphasis has been given to the hopefulness of competency-based education and teacher education programs as contexts for research. If properly organized, and if measures of competence are of sufficient quality, they represent contexts wherein research can be carried out at low cost and high external as well as internal validity. This is a condition that has never existed in education or teacher education and, if established, represents for the first time the possibility of the profession's moving to an empirically based mode of operation.

It has also been emphasized throughout the paper, however, that attempting to combine research and education functions is a complex and often risky venture. Competency measures of a quality that permits them to be used in research, for example, are costly and difficult to obtain. Controlling for sources of unwanted variation through use of experimental and control groups places constraints upon program operators that are often frustrating if not tolerable. As pointed out earlier (see p. 13), at least five conditions seem to be needed if an ongoing education program is to serve as an ongoing research context:

Persons responsible for the management and operation of the program must be inclined toward experimentation. Commitment to empiricism and the desire to know must be dominant features of the context. Research must be viewed as an integral part of program operation, and as such, viewed as a continuous, necessary and desirable part of the program.

Persons responsible for the management and operation of the education program must view it as subject to continuous change, and view as a major data source for its change a systematically designed program of research on its effectiveness. When viewed in this way, research can have both the immediate and applied value that it needs in order to be supported by those responsible for program operation.

Data of a quality that will support trustworthy research must be collected as a normal part of program operation. Accurate, reliable descriptions of program operations must be provided, and accurate reliable measures of learning outcomes must be recorded as a matter of course.

Sophisticated data management, storage, retrieval and display capabilities must be available. Data to be used for research, program operation and program adaptation purposes must be routinely stored on computers and routinely retrieved in formats that support program-related decision making and research.

There must be an advisory structure that insures that the research pursued has value to persons in the program as well as to the profession at large.

Contextually valid experimental research lays heavy demands on ongoing educational programs, and unless the context within which a program rests is special, in many ways the demands of research simply cannot be met.

Since fully operational CBTE programs are only now coming into existence, it is obviously premature to look to such programs for examples that are functioning as research contexts. Energies and resources beyond those required for program operation have been directed largely to program development. And they continue to be. Moreover, even if energy and resources were available for research, few programs have developed measures of competence of a quality that permits them to be used for purposes of research.

Be this as it may, two CBE Centers have begun to direct attention to the research function: the OCT-TR Center in Monmouth, Oregon and the Center at the University of Toledo. Though incomplete in their development, these two Centers will be described in the pages that follow as prototypic of the kinds of contexts envisioned ultimately for a reasonable number of CBE programs.[11]

The CBE Center At Oregon College Of Education As A Context For Research

The Elementary Teacher Education Program at OCE meets the recommendations outlined above in that it has the following characteristics :

The public commitment of staff and administrators to the research function the program is to serve;

The public commitment of staff and administrators to the program being subject to continuous change, and for the direction of change to depend to a large extent upon the results of research on program effectiveness;

The systematic collection of data for use in research on (a) the characteristics of the ETE program (curriculum, organization); (b) the characteristics of students in the program (traits, background experiences); (c) the knowledge, skill and demonstrated teaching competence of students in the program; (d) the behavior and learning outcomes of pupils taught by students in the program; and (e) the characteristics of the settings in which teaching occurs;

The maintenance of quality in all measures taken in the program through continuous quality assurance studies;

A computer-based data management system that supports all research and quality assurance studies;

An advisory structure that insures that the research pursued in the program has value to the profession at large as well as to those in the program, and at the same time reflects a level of quality that sets a standard for research in the profession; and

---

[11] Other CBE Centers are engaging in research activities, for example, Florida State University and the University of Wisconsin, but as yet these centers have not taken steps to organize explicitly as contexts for research.

A support structure through the college and the Teaching Research Division of the Oregon State System of Higher Education that provides assistance to individual staff members doing research.

Other features of the program add to its uniqueness as a research context. Three of these are (a) the OCE faculty has defined teaching competence as the ability to bring about the outcomes expected of a certificated teacher holding a certificated teaching position; (b) the ability to bring about such outcomes must be demonstrated in on-going school contexts; and (c) the most critical competence to be demonstrated is the ability to bring about desired learning outcomes in pupils. Such a definition of teaching competence leads to a powerful set of dependent measures for use in the research carried out at the Center.

In addition, the OCE program is organized in such a way that blocks of 30 students can be systematically treated as experimental or control groups (each block of students is viewed as an *instructional unit* within the program); all faculty in the program have accepted common definitions, measures and performance standards relative to the teaching competencies to be demonstrated by graduates of the program; and all faculty have agreed to try alternative instructional programs and procedures to help students achieve competence as teachers, but to carefully document all programs and procedures tried. Approximately 240 students are enrolled in the Elementary Teacher Education Program at the college each year, providing thereby at least eight instructional units for treatment as experimental or control groups each year.

The Paradigm That Guides Research in the OCE Program

The OCE-TR Paradigm for Research on Teacher Education has three defining characteristics: It is longitudinal; it is multi-dimensional; and it is model-dependent. These are described briefly in the paragraphs that follow.

LONGITUDINAL CHARACTERISTICS. As planned now each teacher graduating from the OCE Elementary Teacher Education Program is assessed for his or her competence as a teacher on at least six separate occasions. Three of these occur prior to graduation; three follow graduation. The schedule for these assessments is as follows:

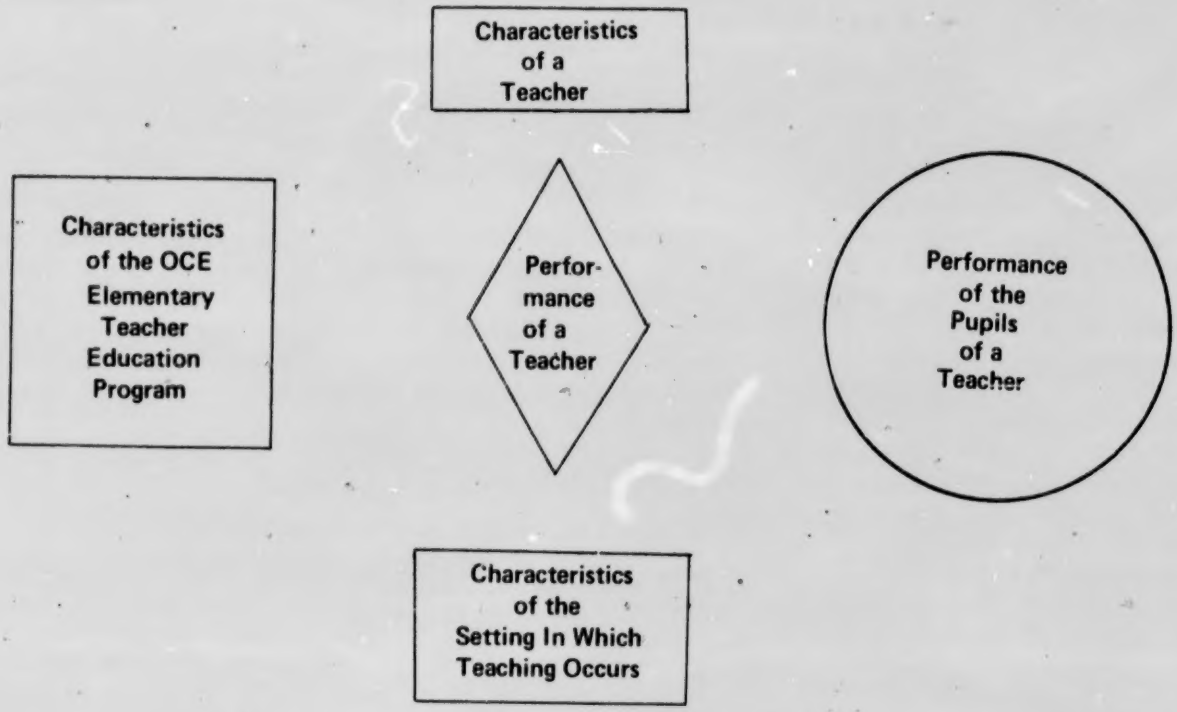
Prior to graduation

- Lesson teaching
- Short Term (2-5 days) Full-Responsibility teaching
- Extended (2-5 weeks) Full-Responsibility teaching

After graduation

- During the first full year of teaching
- Between the third and fifth full years of teaching
- Between the seventh and the tenth full years of teaching

MULTI-DIMENSIONAL CHARACTERISTICS. Five major data sets are called for in the paradigm. These are (a) data on the background and personality characteristics of students preparing to be teachers; (b) data on the characteristics of the teacher preparation program; (c) data on performance as a teacher; (d) data on critical features of the setting in which teaching takes place, including the characteristics of pupils being taught; and (e) data on the learning outcomes of pupils being taught. In combination, the five data sets permit an almost endless array of questions to be asked in relation to the Elementary Teacher Education Program and the effectiveness of teachers prepared through it. The data sets can be portrayed schematically as follows.


Characteristics of a Teacher
Characteristics of the OCE Elementary Teacher Education Program
Performance of a Teacher
Performance of the Pupils of a Teacher
Characteristics of the Setting In Which Teaching Occurs

MODEL-DEPENDENT CHARACTERISTICS. The data sets within the paradigm, and the variables within each set, are referenced against (but not dictated by) three *models* that pertain to the preparation of teachers. These are (a) the OCE model of tasks to be performed by elementary teachers; (b) the Spady model of teacher effectiveness; and (c) the Schalock model of the critical variables involved in instruction. The critical dimensions of the OCE model are reflected in the measures of teaching competency that are applied to all prospective teachers in the elementary program (the OCE-TR System for the Assessing Competence of Elementary Teachers, 1974). The Schalock and Spady models are described on pp. 18 to 19 and 24 to 25, respectively.

Data Sets and Analysis Strategies

Each of the five data sets included in the research paradigm is made up of a number of measures. Table 5 contains a listing of these measures for four of the five sets. Descriptors of program characteristics are left to individual staff members interested in testing particular program effects.

Using various combinations of the five data sets a broad range of questions about teacher preparation and its effectiveness can be addressed. The simplest and most straightforward of these involve data from two sets; a more complex set of questions can be asked that involve three or four. Examples of questions involving two data sets are:

The relationship between program characteristics and teacher performance; and

The relationship between teacher performance and pupil outcomes.

Examples of questions involving four of the data sets are:

The relationship between program characteristics and teacher performance, when variation in performance is controlled for variation in both teacher and setting characteristics; and

The relationship between teacher performance and pupil outcomes, when variation in performance is controlled for variation in both teacher and setting characteristics.

In addition to questions that focus on the relationship between data sets, it is possible to raise questions about change in selected variables within sets. Change in teacher characteristics or teacher performance over a period of years, for example, would seem as important to investigate as any of the questions suggested above. Obtaining answers to such questions, of course, requires careful control for the effects of maturation and setting, but given such control, studies of change are as easily pursued within the OCE-TR paradigm as studies of relationships.

Code books are being developed for each data set included in the paradigm. These will involve reasonably detailed descriptions of each of the measures included in each data set, along with information from quality assurance studies as to the level of confidence that can be placed in them.

Specific Research Plans

As yet, few substantive studies have been undertaken within the context of the ETE program. Quality assurance and methodological studies have been a part of program operation since its beginning, but only one substantive study has been done to this time. This is a study that compares the effectiveness of student teachers and first-year teachers prepared at OCE under the new (CBTE) Elementary Teacher Education Program and the old. While premature from the point of view of the quality of the measures used in the study, it had to be undertaken when it was because of the availability of the two populations studied. If the study had been delayed, it would never have been able to be made.

With the beginning of the 1974-75 academic year, measures of teaching competence have reached a point of stability that substantive research can begin to draw upon them. Also, sufficient energy has been freed from the demands of development that a program of research could at least be contemplated. As a consequence, a reasonably ambitious program of research is being launched, and it is being launched without funds specifically earmarked for purposes of research. The hope is that by collecting data on the various measures outlined in Table 4 as a part of normal program operation, the data collection aspect of the proposed research will be feasible within the limited resources available. There is the further hope that entering all competency demonstration data into computer storage at the time it is collected will make the data management aspect of the proposed research economically feasible. What is not clear is whether the limited resources available for analysis will balance the resources needed, and whether the limited time and energy on the part of the faculty that can be given to research (all faculty at OCE carry full-time teaching loads) will permit full use and reporting of the data even if it is collected.

Without funds for research, the coming year will afford a clear test of one of the central propositions underlying the OCE program: that high quality research can be carried out within the context of a CBTE program at little cost so long as the data collected as a part of normal program operation is of a quality that will permit it to be used in research. The substantive research planned for the coming year is summarized in Table 6. Long range projections include plans for model testing and principal identification studies as well (see pp. 22 to 24).

In addition to the substantive studies planned for the coming year, a large number of instrumentation and quality assurance studies will also be carried out. These are listed in Table 7. These studies are seen as an integral part of program operation and thus are carried out on a continuing basis.

Table 5. A Summary of Variables On Which Measures Are Taken In The OCE-TR Paradigm For Research On Teacher Preparation

TEACHER CHARACTERISTICS VARIABLES

Background Characteristics

- SES
- Birth Order
- Experience with children

Physical Characteristics

- Sex
- Age
- Body type

Scholastic Ability

- College GPA
- SAT Scores
- Scores on the abstract-concrete thinking scale of the 16 PF test

Personality Characteristics

- Selected measures from the 16 PF test
- Selected measures from the Edwards Personal Preference Inventory
- Selected measures representing various combinations of 16 PF and Edwards scores

Attitudinal Characteristics

- Attitudes toward self
- Attitudes toward teaching in general
- Attitudes toward selected aspects of teaching

Preferred Learning Style And Cognitive Orientation

TEACHER PERFORMANCE VARIABLES*

Competency Cluster I. Planning and Preparing for Instruction

General Planning

- I.1 Thoroughness
- I.2 Appropriateness

Special Unit Planning

- I.3 Desired learning outcomes
- I.4 Indicators of outcome achievement
- I.5 Strategies, materials, and procedures

Competency Cluster II. Performing Instructional Functions

- 2.1 Conveying learning outcomes desired from instruction
- 2.2 Adapting instruction to context
- 2.3 Building motivation and interest in learning
- 2.4 Providing for variety in instructional activities and levels of thinking
- 2.5 Dealing with subject matter

*The dimensions of performance listed are those that appear in the assessment system used at the point of entry into the profession (INITIAL Certification). The system is presently being extended to cover advanced levels of certification.

Table 5 continued

2.6 Managing the use of instructional materials, procedures and activities
2.7 Managing potentially disruptive events
2.8 Managing transitions and terminations
2.9 Assessing learning outcomes
2.10 Planning instruction of the basis of learning outcomes

Competency Cluster III. Summarizing And Interpreting Learning Outcome Data

3.1 Summarizing data
3.2 Interpreting data
3.3 Using data to plan next steps

Competency Cluster IV. Relating Interpersonally

4.1 Responding to pupils concerning instructional matters
4.2 Responding to pupils concerning personal matters
4.3 Relating to supervisors, principals, curriculum specialists, etc.

Competency Cluster V. Performing Related Professional Responsibilities

5.1 Managing non-instructional activities
5.2 Meeting work schedule demands
5.3 Maintaining the learning environment

PUPIL OUTCOME VARIABLES

Process Outcomes

6.1 Pupil involvement in the instruction-learning process
6.2 Pupil feelings about the instruction-learning process
6.3 Pupil responsiveness to the teacher

Product Outcomes: From a 2-5 week Full-Responsibility Teaching Experience

7.1 Knowledge and skill outcomes
7.2 Attitudinal outcomes
7.3 Other outcomes, for example, reading skill and comprehension outcomes; problem solving and social interaction outcomes

Product Outcomes: From a diagnostic-developmental project with three or more individual children

DESCRIPTORS OF THE SETTING IN WHICH TEACHING OCCURS

Characteristics of the School in Which Teaching Occurs

Location
Organization of space
Organization of curriculum
Organization of faculty

Table 5 continued

Characteristics of the Classroom in Which Teaching Occurs

- Number of pupils
- Pleasantness of surroundings
- Availability of materials

Characteristics of Pupils Taught

- Modal age
- Grade level
- Ratio of boys to girls
- Ratio of children with above average intelligence
- Ratio of children from above average socio-economic families
- Ratio of children from Caucasian parents
- Ratio of children with physical impairment
- Ratio of children with intellectual impairment
- Ratio of children with emotional impairment

DESCRIPTORS OF THE OCE ELEMENTARY TEACHER EDUCATION PROGRAM

(To be provided by individual staff members doing research on program effects.)

Table 6. Substative Research To Be Pursued Within The Context Of The Elementary Teacher Education Program At OCE During the 1974-75 Academic Year

POLICY-ORIENTED STUDIES

Cost-Benefit Studies

On-Line Program Evaluation Studies

- the collection of program adjustment data
- the collection of program design data

PRACTICE-ORIENTED STUDIES

Follow-Up Studies

- on first year graduates of the ETE program
- on drop-outs from the ETE program

On-Line Studies of Short Term Program Effects

Continuation of the Study on the Effectiveness of Student Teachers Prepared at OCE Under Competency and Non-Competency Based Programs

BASIC RESEARCH STUDIES

Hypothesis Testing Studies

- predictors of teacher responsiveness to pupil needs and circumstances
- teacher responsiveness to pupil needs and circumstances as a predictor of teaching success

Hypothesis Generating Studies

- a search for correlates of competency
  - . mastery of knowledge and skills that pertain to teaching
  - . personal characteristics such as age, sex, academic ability and body type
  - . personality characteristics
  - . attitudinal characteristics
  - . background characteristics
  - . the characteristics of the setting in which teaching occurs
- studies of change
  - . in personality
  - . in attitudes
  - . in demonstrated teaching competence
- a search for correlates of change
  - . mastery of knowledge and skills that pertain to teaching as correlates of change in personality and attitude
  - . demonstrated teaching competence as a correlate of change in personality and attitude

Table 7. Methodological Studies To Be Pursued Within The Context Of The Elementary Teacher Education Program At OCE During the 1974-75 Academic Year

QUALITY ASSURANCE STUDIES
Form Use Studies
Indicator Use Studies
Rating Patterns And Distribution Studies
Inter-Rater Reliability Studies
DATA DISPLAY STUDIES
The Display Of Quality Assurance Data
The Display Of Competence Data
The Development Of Procedures To Prepare And Display Cost-Benefit Data
INSTRUMENTATION STUDIES
The Refinement Of Instruments
Used in Assessing Teaching Competence
Used in Assessing Attitudes Toward Self and Teaching
Used in Assessing Learning Style and Cognitive Orientation
Used in Assessing the Setting in Which Teaching Occurs
The Predictive Power Of Competency Measures Obtained Under Differing Conditions Of Teaching

Documentation Studies

Serious efforts are being made to describe the volutions of CBTE at Oregon College of Education and in the state at large. This is being done for two reasons. The first has to do with a sense of history. CBTE represents a major development in teacher preparation in the United States, and its evolution within an institution and state should be recorded as fully and as accurately as possible. The second has to do with what might be helpful to others. The availability of well-documented case studies of CBTE efforts in states and institutions could have genuine utility to others who are attempting to implement such programs. While it is recognized that each institution and state must make its own particular adaptation of CBTE, being able to draw upon the developmental histories of others could be of considerable help in doing so.

Three documents have been produced thus far that describe various aspects of the Elementary Teacher Education Program at OCE. These are, in the order in which they have been produced,

> Schalock, H.D.; B.Y. Kersh; and J.H. Garrison *From Commitment to Practice in Assessing the Outcomes of Teaching: A Case Study,* in T. E. Andrews (Ed.) Assessment in Performance-Based Teacher Education. Albany, New York: Multi-State Consortium on Performance-Based Teacher Education, 1974.
>
> Schalock, H.D. *Notes on a Model of Assessment That Meets the Requirements of Competency Based Teacher Education,* in W.R. Houston (Ed.) Exploring Competency Based Education, 1974.
>
> Albritton, R., and staff of the OCE program. *A Case Study: The OCE Competency Based Teacher Education Program.* (The program description on which the 1974 AACTE Distinguished Achievement Award was granted.)

Two documents have been produced that describe the Oregon translation of CBTE principles into accreditation standards. These are:

> The Process Standards for Educational Personnel Development Programs, prepared by the Oregon Teacher Standards and Practices Commission, 1973; and,
>
> An interpretive paper that spells out the implications of the proposed Process Standards for defining and assessing teaching competence (Schalock, 1973).

These and other products developed at the OCE-TR Center for Competency-Based Education are described in a brochure that may be obtained on writing the college or Teaching Research.

Three additional documentation efforts are underway: a description of both the development and operation of the AACTE award-winning Elementary Teacher Education Program at OCE; a description of CBTE in Oregon as a whole; and a description of CBTE in the Northwest. The description of the Elementary Teacher Education Program at OCE is to be published as a monograph in the AACTE Series on competency-based teacher education. The description of CBTE in the state as a whole derives from a study that identifies in each teacher preparation institution in the state all program elements that reflect features of the competency-based teacher education movement, and the extent of their development. The results of this study are to serve as a baseline against which to chart progress in CBTE in Oregon following the state's adoption in July of a new set of standards for program approval that reflect the essential features of competency-based teacher education. A report of this study may be obtained by writing to either Dr. Richard Jones, Executive

Director of the Oregon Teacher Standards and Practices Commission, or Dr. Del Schalock at the Teaching Research Division of the Oregon State System of Higher Education.

A set of *protocol* materials is being developed to document CBTE within the Northwest. The aim of the study is to develop a set of slide-tape presentations that presents the basic concepts of competency-based teacher education, as those are portrayed in the Comfield model of CBTE, and to document how these concepts have been interpreted and implemented within the various states of the region. Two protocols are being developed for each Northwestern state, one describing the position of the State Department of Education toward CBTE, and one describing how that position has been translated into program by an institution within each state.

Nine slide-tapes are to be developed in all. It is anticipated that the protocol project will be completed by early Fall, 1975.

The CBE Center At The University Of Toledo As A Context For Research

The CBE Center at the University of Toledo has not progressed as far in its implementation of the research function as the OCE-TR Center, but it is well on its way. Faculty and administrators of the University have declared the research function; they have begun to organize for it; and they have developed a model that is to guide the major research thrust within the Center. The pages that follow outline the research model developed at the University of Toledo and the plans that have been made for its implementation.[12]

Any research model that would provide for comprehensive research in CBTE would of necessity require great specificity before it could be operationalized. It is not the purpose of this discussion to provide such a detailed description. Rather, the purpose here is to provide a broad framework within which the specific details of conducting research can be developed. The ideas of the broad model discussed herein were initially presented by Donald Medley, and subsequently developed further by Robert Soar and the University of Toledo staff.

The major context within which research in CBTE is focused is diagrammed in Figure 3. The focus of the research is upon the relationships between teacher behavior and pupil outcomes, and the effects of variations in teacher behavior upon pupil outcomes. When an undergraduate program in CBTE is being researched, the teacher behavior is that of undergraduates in the program, manifested through student teaching, participation, or other undergraduate activities. Pupil outcomes may be in the form of immediate behaviors or more long-range outcomes. Examples are observations of classroom behavior, scores on standardized tests, and scores on affective inventories.

The chain of effects in going from teacher behaviors to pupil outcomes has a multitude of interrelated links or factors. In the model of Figure 3, the major focus is upon the center boxes, with pupil behavior and outcomes being overlapping to some extent. The teacher training program is a major factor in shaping teacher behavior, but other factors also influence both teacher behavior and pupil outcomes. Examples of these are listed in the figure.

Within the context of the variables presented in Figure 4, a multifaceted research program can be generated. Certain components of such a program would be sequential: others would be concurrent. The program could be developed for both elementary and secondary CBTE,

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[12] What follows has been prepared by Dr. William Wiersma, Jr., University of Toledo. Another excellent description of the CBTE program operated by the University has been prepared by Dickson, Saxe, *et al.*, (1973).

or it could be limited to a subgroup of teacher-education students--for example, those preparing to be secondary mathematics teachers.

A logical starting point with a research program would be the generation of correlational data relating variables between the boxes of Figure 3. (Variables within boxes could be considered singly, as composites, or as any combination.) Correlation coefficients would not, of course, in themselves be conclusive evidence of cause and effect, but they would provide a base for generating hypotheses. The data necessary for the teacher education portion to a large extent exists, although in the past it has seldom been systematically collected. Data for the pupil outcomes, school context, etc. have been collected in the past, although seldom in connection with research in teacher education.

In implementing a research program, it is anticipated that new systems of data monitoring and collecting will be developed. Also, it is not likely that existing measurement instruments will prove adequate, especially on the teacher education end, and therefore at least some new measuring instruments will be developed.

After a number of hypotheses have been generated, it will be possible to move into three situations for testing hypotheses: (1) Ex post facto field studies, (2) field experiments, and (3) laboratory experiments. To some extent these kinds of studies can be conducted concurrently. With a subgroup of teacher-education students in a program, it may be desirable to conduct the studies sequentially, reversing the order listed above. This sequential ordering is not a prerequisite, but it may prove convenient for the schedule of the training program.

Laboratory experiments provide the situation of greatest experimental control. Many of these experiments would be conducted on campus, although this is not a requirement. Peers of the teacher-education student, and possibly selected groups of pupils, would serve as the subjects for the laboratory experiments.

The field experiments would be conducted primarily during student teaching or comparable experience. In the field experiments situations, the experimental control would be less than with the laboratory experiments, but at least some measure of control could be exercised. For example, the kind of teaching strategy used and the content of a lesson could be specified and explicitly developed prior to the field experiment.

Field studies can take place under a number of conditions. Less controlled situations during the student-teaching experience would be an example. The field studies would apply to programs that incorporate some type of intern experience. Also, field studies could be used for the followup of first-year (or later) teachers. Any situation which could not improve its experimental control, but in which appropriate data collection can take place would be usable for a field study.

As the research data are generated, the relationships and corresponding inferences between the variables of the boxes of Figure 3 would be identified and developed. The stronger inferences are likely to come between variables of adjacent boxes. However, with a systematic study of the variables, the chain of inferences should be completed from the teacher training program variables to the pupil outcomes variables.

The matter of data analysis is primarily a technical matter, but the research model lends itself to a variety of procedures. Bivariate correlation, multiple regression, canonical correlation, factorial analyses (both ANOVA and COV), and factor analysis are possible analysis procedures. Analyses will, or course, depend upon the hypotheses being tested.

The research model discussed herein focuses directly upon the variables in the teaching-learning context. Within this context it has broad and comprehensive application. It does not focus on research of matters such as university policy and funding procedures, although the results might well have implications for such matters.

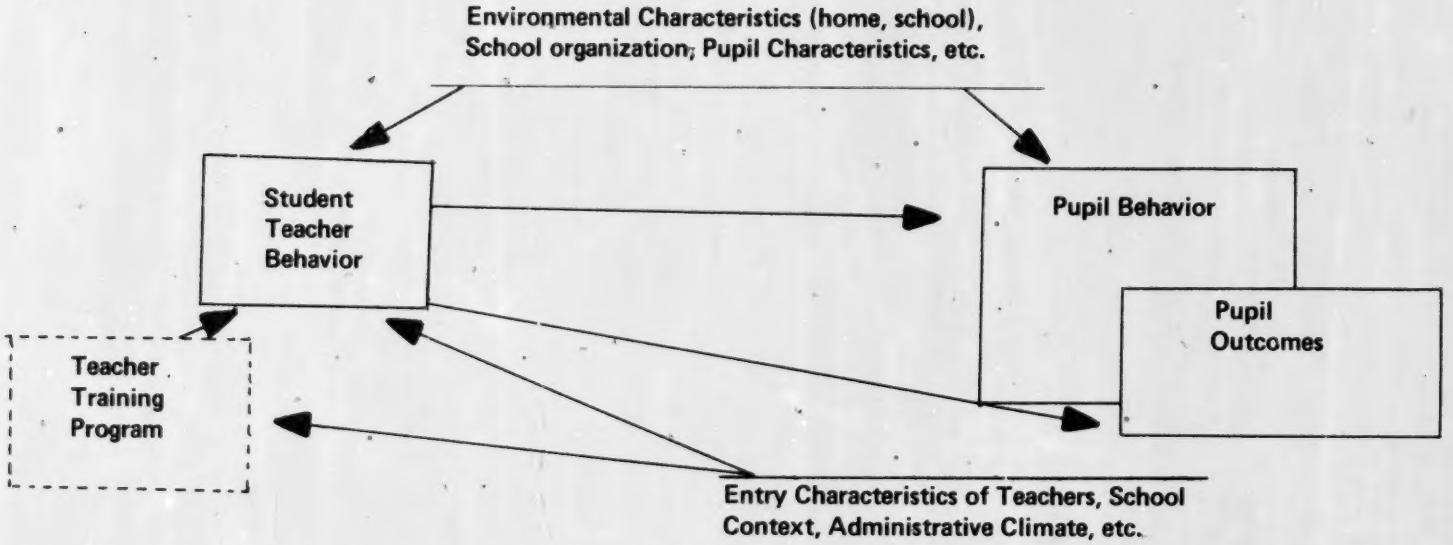

Figure 3. General Model of Effects in CBTE

PART VII. PROBLEMS, PROSPECTS AND A PLAN OF PROCEDURE

Outlining the kind of research and development program needed in relation to CBTE is one thing. Implementing what has been outlined is something else. It seems appropriate, therefore, to close a paper of this kind with a brief look at the task of translating what has been proposed into practice, and to offer at least tentative observations as to how that translation process might take place.

Some Anticipated Problems

It has been argued that only now is it possible to begin to undertake the kind of research and documentation studies that have been called for in the paper because only now are functional CBTE programs beginning to be established. It is simply not possible to compare the cost and benefits of CBTE with non-CBTE programs until CBTE programs are available for comparison. The same argument obviously pertains to using CBTE programs as contexts within which to carry out practice-oriented research, basic research, and documentation studies.

Even though illustrative CBTE programs are now beginning to emerge, a host of problems remain before the kind of research and documentation called for in the present paper can be undertaken. Many such problems were referred to in the course of the paper--for example, finding CBTE programs that are willing to face comparison with other programs or that are willing to accommodate the demands of ongoing practice-oriented and basic research studies. Other problems remain, however, and need at least to be identified. The more important of these would seem to be

> Assuring the continued development and operation of competency-based teacher education programs as demonstration and research contexts;
>
> Securing the funding level needed to carry out the research and documentation studies outlined in the present paper;
>
> Finding competency-based teacher education programs that are at a level of development and possess sufficiently competent staff to carry out the kind of research and documentation programs outlined; and
>
> Fixing responsibility for the long term coordination and management of the research and documentation program called for.

A number of these problems revolve around the availability of funds. This is obviously the case with respect to the research activities that have been proposed. Funding is also involved, however, in the continued development and operation of CBTE programs. Unless viable CBTE programs exist, most of what has been proposed is, in the parlance of the day, inoperative.

Some of these problems are not so much a matter of money as they are the availability of personnel who are competent to carry out the necessary functions. In this regard, two broad sets of functions need to be performed: developing and maintaining a CBTE program

that can in fact support the kind of research that has been called for, and actually carrying out the research and documentation activities.

Finally, a number of these problems are plainly and simply a matter of the National Institute of Education's and the U.S. Office of Education's agreeing to the importance of the kind of research and development effort that has been outlined; to the probability of its short- and long-term contribution to the betterment of education and teacher education in the nation; to the priorities of the proposed program as compared to the priorities of other programs that are being supported; to the priorities of the various activities called for within the over-all program; and to the responsibilities to be assumed individually and collectively by the two agencies for the implementation, funding and management of the program. In approaching the various problems and issues that have been identified, it is recommended that the last issue mentioned be attended to first, since decisions reached at that level will largely determine what happens in relation to all else,

Some Optimistic Projections

Assuming the National Institute of Education and the U.S. Office of Education were able to reach the decision that the proposed program is worth supporting, that it had high priority in relation to other programs, that agreements were able to be reached in terms of shared responsibility for supporting and managing the program, that a reasonably high level of funding was made available to the program, and that operational CBTE programs could be found that were willing to serve as research contexts, what could be expected to emerge from the program at the end of a three year period? At the end of five years? At the end of ten years? The projections that follow attempt an answer to these questions. They assume that all lines of inquiry that have been recommended are to be supported.

Products And Conditions At The End Of Three Years

DATA FROM POLICY-ORIENTED STUDIES

Preliminary data on costs and benefits of CBTE and non-CBTE programs

Preliminary data on costs and benefits of alternative forms of CBTE programs

Methodologies, settings, and personnel established to carry out long-term policy studies

DATA FROM PRACTICE-ORIENTED STUDIES

Preliminary data on the costs and benefits associated with selected instructional practices within particular CBTE contexts

Methodologies, settings, and personnel established to carry out long-term studies of the costs and benefits associated with selected instructional practices within particular CBTE institutions

Methodologies, settings, and personnel established to carry out cross-institution replications of cost and benefit studies on selected instructional practices

DATA FROM BASIC RESEARCH STUDIES

First level taxonomic work completed in relation to the construct delineation studies, related literature reviews completed, design and measurement methodologies tested, and some replication data on constructs that have appeared promising in existing education and psychology literature

Theoretical positions that link the constructs identified in the research paradigm stated at an initial level of detail, related literature reviews completed, design and analysis methodologies tested, and studies in progress that test the soundness of the theoretical structures that guide the assembling of variables.

Initial models to be tested identified, variables within the models delineated, related literature reviews completed, design and and analysis methodologies to be used in testing the models specified, and studies in progress to both clarify the variables involved and establish trustworthy measures for their investigation

CASE STUDIES FROM THE DOCUMENTATION EFFORTS

At least three case studies on selected CBTE institutions covering at least two years of development and implementation decisions

At least six case studies on selected attributes of competency-based teacher education that have a two-year history of development and implementation

Products And Conditions At The End Of Five Years

DATA FROM POLICY-ORIENTED STUDIES

Sufficient data on costs and benefits of CBTE and non-CBTE programs that policy decisions can be made with reasonable confidence

Sufficient data on costs and benefits of alternative forms of CBTE programs that policy decisions can be made with reasonable confidence

Methodologies, settings, and personnel established to carry out whatever additional policy studies are needed

DATA FROM PRACTICE-ORIENTED STUDIES

Sufficient data on the short-term costs and benefits associated with selected instructional practices in particular CBTE contexts that program implementation decisions can be made with reasonable confidence

Preliminary data on the long-term costs and benefits associated with selected instructional practices in particular CBTE contexts

Initial replications across institutional settings of cost/benefit studies on selected instructional practices

DATA FROM BASIC RESEARCH STUDIES

An initial set of empirically grounded constructs within each cluster of variables identified in the research paradigm that has been proposed

Measurement methodologies firmly established for each construct within each cluster of variables in the paradigm

The theoretical structures that link the constructs identified in the research paradigm reasonably well worked out, and reasonably productive in terms of hypothesis generation

Design and analysis methodologies firmly established for research on principles of teaching, given the constraints of the paradigm governing principle related research

A beginning collection of empirically based principles of instruction that are suggestive of the nature of the interactions between the variables listed in the paradigm on teaching.

Measurement methodologies firmly established for each variable in the various models to be tested, and initial test of the utility of the models underway

CASE STUDIES FROM THE DOCUMENTATION EFFORTS

Completed case studies on three selected CBTE institutions (each case study would cover a four-year period of time)

Six additional case studies of selected attributes associated with competency-based teacher education programs that have had at least a two-year history of development and implementation (making a total of twelve such documentaries)

At least three case studies covering a two-year period of time on institutions that are serving as centers for research in CBTE

Products And Conditions At The End Of Ten Years

DATA FROM POLICY-ORIENTED STUDIES

The completion of whatever cost-benefit studies are needed on CBTE as opposed to non-CBTE programs

The completion of whatever cost-benefit studies are needed on alternative forms of CBTE programs

DATA FROM PRACTICE-ORIENTED STUDIES

Short-term cost and benefits studies essentially completed on selected instructional practices within particular CBTE contexts

Sufficient data on long-term cost and benefits of selected instructional practices in particular CBTE contexts that program decisions can be made with reasonable confidence

Sufficient cross-institutional replication data on cost-benefit studies of selected instructional practices that program decisions by a wide variety of institutions can be made with considerable confidence

DATA FROM BASIC RESEARCH STUDIES

Second-generation construct delineation research underway, and the theoretical structures within which constructs rest under empirical test

Second-generation methodology and design in relation to construct delineation studies under development

A sizeable number of principles of teaching established, and established with sufficient confidence that program design as well as on-line teaching is able to benefit from their application

An initial set of models tested, refined, extended, or replaced with more promising models, and these in turn ready to be submitted to empirical test.

CASE STUDIES FROM THE DOCUMENTATION EFFORTS

All case studies on CBTE programs and program elements completed

All case studies on CBTE programs as contexts for research completed

Figure 4 represents a translation of these projections into a simple time/task chart.

A Plan Of Procedure

Any of a dozen strategies could be followed in implementing the program of research and documentation that has been proposed. Each would have advantages and disadvantages; and more than one would undoubtedly prove to be successful. Be that as it may, a number of

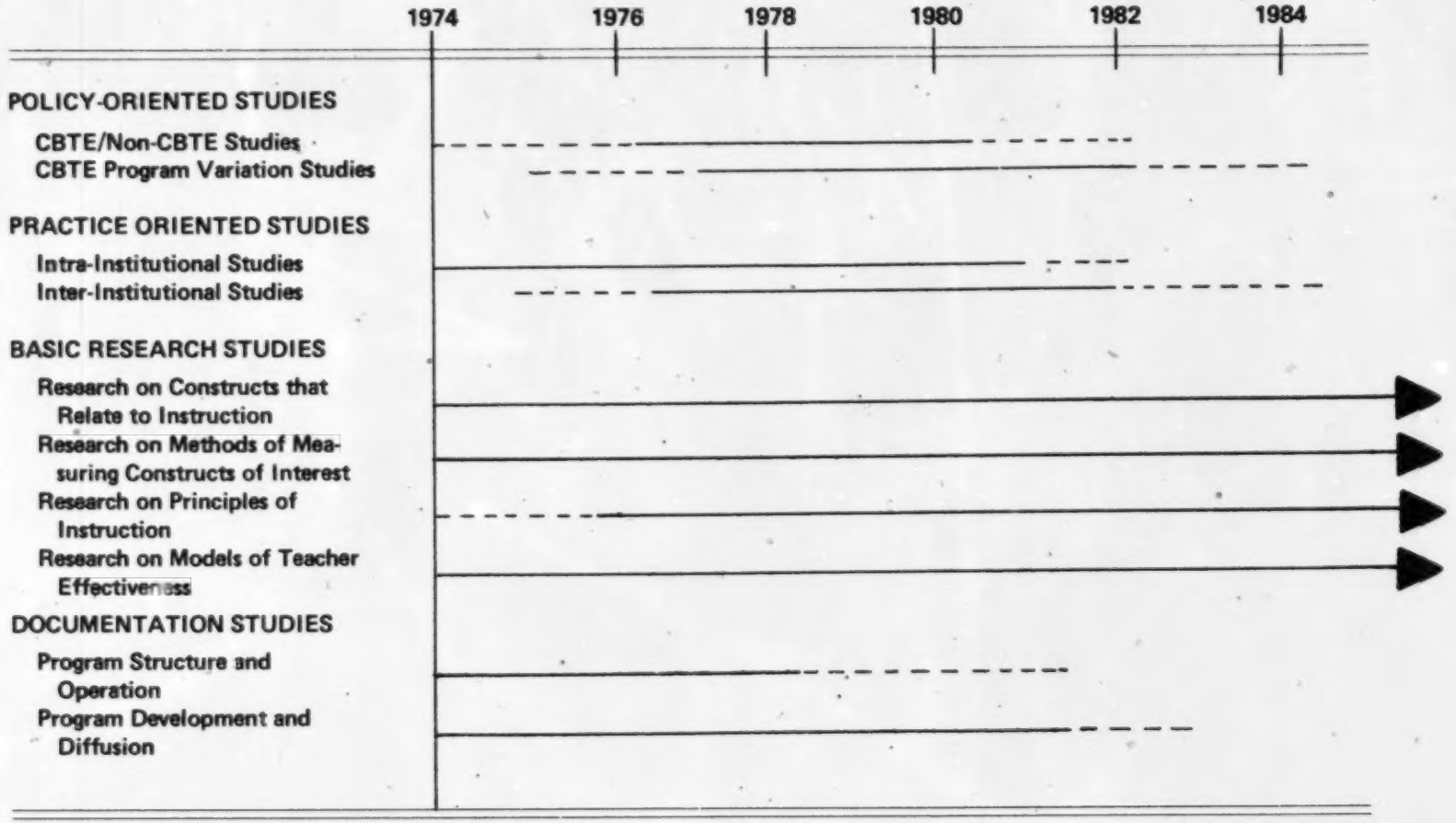

Figure 4. A time/task chart that summarizes projections for the proposed research program.

recommendations are offered at this point to assist in its implementation. The recommendations assume NIE and OE agreement as to joint sponsorship of the proposed program, and agreement as to the division of responsibilities therein.

1. Begin work on all aspects of the research proposed, even though there may not be enough money to do so on a large scale. All of the research efforts outlined need to be done; each will contribute to the other; and each will serve the needs of different audiences.

2. Take fully into account the program development work needed in order to carry out the research that has been proposed, and then see to it that the development and the research aspects of the over-all program are closely coordinated. Without such attention to development there is danger that the research contexts on which the entire proposal is predicated will not be available.

3. Share the research and development costs across federal agencies; for example, have NIE assume the costs of research and OE assume the costs of development and documentation.

4. Keep responsibility for managing the over-all research program a federal responsibility, rather than a state or non-federal responsibility.

5. Hinge the program on competitive proposals that are in response to RFP's.

6. Direct most of the funding for research to institutions that have CBTE programs that can function as R&D contexts (funds should not be directed to existing R&D Centers unless they are linked to CBTE programs that meet the criteria for CBTE research centers).

7. Before letting research contracts to any institution, establish carefully the characteristics needed by an institution to carry out the various research and development activities being called for.

8. Implement a dissemination function of major proportions, and target the research and documentation results to be disseminated to the audiences for which they are particularly appropriate.

Obviously, the research program proposed is a massive undertaking. It is also an extremely complex one, and one that in the minds of many would be too slow to produce results or too grandiose ever to get started. In the judgment of the members of the Consortium of CBE Centers, however, and it is a judgment that has been carefully weighed, it is precisely this kind of research program that is needed in order for teacher education programs ever to make the kind of difference in teaching that they are supposed to make. The irony and hope is that by using CBTE programs as contexts for research, costs will be sufficiently reduced and the problem of the external validity of experiements sufficiently overcome, that the program of research that has been proposed can be carried out successfully.

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APPENDIX

COMPETENCY BASED DEVELOPMENT IN THE CONSORTIUM OF SOUTHERN COLLEGES FOR TEACHER EDUCATION: A DOCUMENTATION STUDY[1]

Project Background

This competency-based teacher education project had its genesis somewhere in former Defense Secretary McNamara's notion of project management and accountability which he brought from industry. Additionally, there were roots to be found in the programmed instruction movement of the post-Sputnik late 1950's and early 1960's. Most people, however, saw its germination in the U.S. Office of Education's Comprehensive Elementary Teacher Education Models (CETEM) program which was born on October 16, 1967 when the National Center for Educational Research and Development (NCERD) issued a request for proposals to develop specifications for program models for the preparation of elementary teachers. One of the eligibility requirements for participation of a college in the CETEM program was that it must graduate one hundred elementary teachers annually. This requirement eliminated smaller colleges such as most of those in the Consortium from the competition. Recognizing both the need for smaller institutions with limited resources to participate in change in teacher education and the need to see if the CETEM programs were at all relevant to such schools, during 1969-71 NCERD provided minimal support for ten southern colleges (the Consortium) to band together to accomplish these purposes. Initial Consortium efforts then were focused on examining the CETEM efforts and designing competency-based teacher education (CBTE) programs on each of the campuses of member institutions.

Project Funding

In January 1972, $96,000 was given to the Consortium to develop, implement, and evaluate the CBTE designs which had been growing in the minds of Consortium members over the previous two years. Project management was given over to three former members of the Livingston State University faculty (Livingston had withdrawn from the Consortium) who became known as the Research Team or RT. The RT located at the University of South Alabama which became an Associate Member of the Consortium.

Project Objectives

In its proposal to USOE the Consortium stated the following objectives for the project:

1. That each Consortium member would develop CBTE programs suitable for use in other small colleges and universities. That each member's teacher education program would include an operating management system, a faculty development system geared toward CBTE implementation, and a community involvement mechanism.

2. That certain parts of the CBTE programs (specifically Learning Laboratories, Simulation Laboratories, and Human Relations Laboratories) would be developed and tried out in regional demonstration centers to determine their effectiveness.

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[1] Fortney, H. M. and F. C. Judge. Development and Effectiveness of Competency Based Teacher Education Programs in Emerging Institutions. Final Report to HEW, May, 1973, Consortium of Southern Colleges, University of South Alabama, Contract No. OEG-0-72-0778.

3. That the Consortium would establish a central office for teacher education program development wherein a repository and information dissemination service would be housed. This Center would establish and maintain contacts with others involved in CBTE and teacher education generally. Specific mention is made of AACTE, ERIC, National Laboratories, and R&D Centers, commercial publishers, the national protocal and training materials project, state education agencies, and training complexes.) In addition, the Center would conduct conferences, assemble task forces, and publish a newsletter.

4. That the Consortium Center would develop a consultation service to assist other small schools interested in CBTE.

5. That the feasibility of faculty and student exchanges which would strengthen teaching and learning in CBTE programs would be determined.

6. That Consortium CBTE-trained students would be compared to traditionally trained students.

7. That the results of Consortium efforts would be widely disseminated by the Center.

These seven promises were subsumed under four major project goals as follows: (Numbers in parentheses correspond with the promises. Note some promises are related to more than one goal.)

Goal 1: to design, develop, implement, and evaluate CBTE programs at Consortium schools (1)

Goal 2: to develop and demonstrate selected program components (Learning Lab, Human Relations Lab, Simulation Lab, and Portal Schools) for Consortium schools and selected others (2,4)

Goal 3: to compare modular-trained students with traditionally trained students (6)

Goal 4: to design, develop, impiement and evaluate improved Consortium organization and services (3,4,5,7)

Major Activities and Accomplishments

Two sources of information were used in determining what the project accomplished. The first source was the Research Team (RT) located in Mobile which was responsible to the Consortium for accomplishing the project's goals. The second source was the individual participating colleges.

Goal I: Major activities and accomplishments in relation to designing, developing, implementing and evaluating CBTE programs at Consortium schools. To facilitate the accomplishment of Goal I, the RT made visits to the eleven Consortium schools in order (1) to determine how involved each was in CBTE activities, (2) to establish with each school a systems approach to follow in order to maximize efforts,[2] and (3) to conduct faculty development conferences on a variety of topics, e.g., developing and writing competencies and developing modules. Between July, 1972 and mid-January, 1973, seventeen RT visits

[2]Adopted from Donald R. Cruickshank, *Conceptualizing a Process for Teacher Education Curriculum Development*, Journal of Teacher Education, Spring, 1971.

were made with the intention of working toward the accomplishment of Goal I. Extensive written documentation is available that the Goal I visits were well-planned and executed. Special efforts were made to put personnel and schools on tasks and deadlines and to increase the number of participating faculty.

Work toward Goal I probably was slowed when a technical assistance grant was made to the Consortium to help other small colleges outside the Consortium to work toward CBTE. From August, 1972 until mid-January, 1973 it appears that 27 RT staff days were contributed toward technical assistance exclusive of preparation and travel time involved. This is at least the equivalent of a month's productivity for one staff person. A technical assistance grant, noteworthy as its objective may be, should be supported by the addition of professional staff to the RT. This did not seem to be the case.

Furthermore, other staff days were given to other valuable but extra-curricular events, such as organizing or participating in CBTE conferences sponsored by professional associations and state education departments.

All of these peripheral activities have to detract from work toward the goal of developing, implementing and evaluating CBTE at Consortium schools. On the other hand, RT participation in providing technical assistance must be reinforcing to Consortium members. It must make them feel that their efforts, to some extent, are being widely disseminated and recognized.

As mentioned earlier, a second source of information was the Consortium schools. An instrument was sent to all eleven member schools to assess the progress each had made toward one or more of the four goals undertaken. In order to assess progress toward Goal I, respondents were asked (1) to list major activities undertaken to design, develop and implement CBTE; (2) to list future activities; (3) to describe major accomplishments; (4) to describe the extent to which Goal I would be accomplished by the close of the project period on June 1, 1973; (5) to describe the extent to which it had developed management, faculty development, and community involvement subsystems; (6) to list names, positions and duties of key personnel; (7) to make recommendations to other schools about to enter into CBTE. Following is a report and analysis of the information received in relationship to each of the seven queries listed above for Goal I.

An examination of the major activities reported by member schools to accomplish Goal I revealed substantial agreement on the process followed as they moved toward a CBTE program. The most frequently reported major activities were:

1. All schools began by selected faculty or administrators becoming more aware of the Comprehensive Elementary Teacher Education Model (CETEM) programs. This was accomplished either by reading the final reports, visiting or bringing in consultants from the sponsoring institution, attending the AACTE dissemination conferences or combinations of the above. All schools began this way probably because they were mandated to study the CETEM programs according to their first federal contract.

2. A second order of events seemed to be designed to gain the support of the college administration and particularly the faculty. Even though schools had the Consortium, it seems clear that there was considerable unevenness to that pledge or at least to the ability to carry it out. In this regard members mention holding on-campus faculty workshops on the general nature of CBTE and attending similar meetings held elsewhere.

3. Closely related to the second type of activity was an effort to involve local education agencies in CBTE. In several instances, CBTE proponents conducted meetings for both *insiders* and *outsiders.* Teacher Corps and Triple T Projects were often *in-between* groups which seemed to have a strong impact throughout the development

of CBTE, the former often furnishing personnel and financial support. Since some Washington Teacher Corps Staff (particularly Dr. James Steffensen) were associated with the CETEM program which advocated CBTE, this support was welcomed by the Consortium.

4. Once understanding and broader support seemed to have been secured, colleges become more task-oriented. Several mentioned that they considered CBTE in relation to the current program and identified over-all goals for the new CBTE program. At this point decisions were made to revise the current program and/or to develop a parallel one.

5. Further meetings of a faculty development nature were held to discuss the notions of competencies and modules.

6. Accompanying the above activities was often the need to decide how competencies should be derived. The following alternatives were often considered:

   a. Extrapolating competencies from present courses using course goals.
   b. Selecting competencies from prepared lists.
   c. Extrapolating competencies from concepts, skills, and attitudes teachers need to ensure pupil learning.
   d. Analyzing teacher behaviors and extrapolating competencies therefrom.
   e. Deriving competencies from research and other authoritative sources. (In most cases members used strategy a above probably because some relationships could be established between what professors currently were teaching and CBTE.)

7. The next step was the establishment of individual or group assignments and deadlines or schedules of work, although most schools did not take scheduling too seriously, preferring to go as fast as permissible.

8. Once into module writing, it became evident that access to available modules developed on other campuses was necessary; staff members began to identify and send for materials which were related to their tasks. Surprisingly few people seemed to know of the libraries of modules being gathered at Consortium Central.

9. An awareness also developed that more and/or better field settings (often referred to as Portal Schools) were required wherein CBTE students could learn and/or demonstrate skills. Simulation and microteaching labs also were established in most schools since both methodologies permit the acting-out of teaching behaviors for analysis.

10. Learning Centers were developed wherein curriculum materials were housed and where teaching and learning could occur. Learning Centers seem to range from fairly traditional instructional materials centers to combinations of teaching-learning-materials development operations. Several Centers were hardly adequate in terms of space, materials, services and availability, although all had plans to become more functional.

11. Determining how competencies can be demonstrated and assessed seemed to be an ongoing dilemma both in the Consortium and nationwide. At the 1973 AERA meeting several persons addressed the problem.

12. Field testing of modules took place in courses and revisions were made.

13. Modules were sent to the RT for evaluation and storage.

14. Efforts were made to prepare information about CBTE for other interested schools.

15. Several schools mentioned internal evaluation of the CBTE program but only a few seemed to work at the task in any special way.

It would be an over-generalization to suggest that all the schools followed the aforementioned fifteen major activities or that they were followed in that exact order. However, a majority of the schools were involved in the activities and most activities followed the above order. The value of such an oversimplified analysis is that it can be a guide for others, CBTE-bent, to consider--not necessarily to follow.

When asked what remained to be done to accomplish Goal I before the project's end, some of the above fifteen items were rementioned for two reasons. First, not all schools were at the same place in CBTE, although it is very safe to say that no one seemed to be near program completion using Elam's criteria. Second, member schools must have felt that repetition of activities was necessary either because of the advent of new faculty or to re-inforce earlier CBTE commitments and skills. Most-mentioned continuing activities are:

- consideration of the revision of the traditional teacher education program.
- attendant identification of competencies and writing of new modules.
- revision of existing modules.
- continued procurement of software and hardware to be used in modules.
- field testing of materials, particularly minicourses which could be used.
- use of CBTE with more students.
- expanded use of field experiences.
- development and operationalization of support subsystems particularly management with emphasis on module delivery and record keeping.
- continued attendance at regional or national CBTE meetings.
- submission of new programs for state approval.

The most difficult continuing problem seemed to be the development and operationalization of support subsystems--particularly management, with emphasis on module delivery and record keeping. Members simply did not have staff, facilities, and sometimes know-how to make their CBTE programs functional.

When asked what major observable accomplishments have resulted from CBTE efforts the following were cited:

- courses have been rewritten with behavioral objectives
- modules have been developed to accomplish the behavioral objectives.
- time limits have been removed from teaching and learning.
- new courses have been developed (mentioned often were early experiences--simulation, microteaching and human relations).
- more field experiences have been established.

- there has been greater cooperation with the community and the local education agencies.
- some faculty members have gained recognition both inside and outside the college as experts in CBTE.
- differentiated staffing has been established in the training program and in the schools.
- college has been able to gain entrance to or remain in the Teacher Corps.

All of these perceptions of accomplishment were not shared equally, nor was it possible to determine whether, in fact, all the claims were truly accomplished. For example, with regard to *the removal of time limits on courses,* some schools complained that students were not motivated to work on the modules independently, that they let the work pile up, and that often, at the end of the quarter, incompletes had to be given and/or faculty members were deluged by students making frenzied last-minute efforts to *get work in on time,* a denial of a principle of CBTE.

The fifth question asked about Goal I was *to what extent do you believe you will accomplish the (project's) objectives by June, 1973?* The schools which responded directly said:

- 100%
- All by June 1, 1973
- We are trying to find out. We will make every effort to accomplish the goals.
- We expect to react the objectives.
- By then we anticipate accomplishing the objectives.
- Of the three courses in the professional sequence, all are in some measure competency-based now and we are making inroads into the student teaching program.
- Fully accomplished by June 1.
- A prediction seems inappropriate.

The sixth question asked respondents to describe the extent to which they had fulfilled the proposal promise to develop and utilize management, faculty development and community involvement subsystems to support CBTE. Again there is great variation among schools in the extent and nature of response to this as to other proposal promises. In view of responses to the third-party evaluation questionnaires, it seems safe to say that little man-power is available or given to designing, developing and implementing the program in a formal way. In addition, nothing was mentioned that would suggest much help was provided the Consortium schools for such efforts. Except for early RT efforts stressing one conceptualization for developing a teacher education curriculum and mention of PERT and GANTT charts, models for the subsystems did not appear to be available, and it could be that schools were not even sure what the subsystems should be like.

More often respondents either did not answer the question or answered it in such a way that it was difficult to determine whether the concept of a management subsystem was within their grasp. In February, the Consortium held a meeting wherein a consultant described management systems, but members either did not know about the explanation or found it too general and theoretical. What members seemed to need was precise knowledge about how to get modules to appropriate students at the appropriate time and how to keep

accounts of where students are in the program. Clearly two orders of the problem were present. The members did not seem to have enough help in conceptualization and/or they did not have manpower to allocate to the task.

When asked to list names and positions of key persons in the CBTE program, professional educational personnel predominate, but a wide range of campus personnel are participating. Only one school indicated that among the key persons were local education agency personnel. Only one school cited state department persons. Research Team (RT) members were named as key personnel by some and not mentioned by others. No one answered another part of the question which asked, *What special efforts were made to improve the qualifications of key persons. . . . ?* Perhaps this should not be so surprising in that the whole idea of a faculty development subsystem seemed not understood, not well-reported, or neglected.

The final question under Goal I asked respondents to, in retrospect, make recommendations to other schools like their own who are about to enter into CBTE. Here respondents answered most readily and two schools of thought surfaced. One school advocated jumping right in: *Begin, don't wait until everything is perfect and everyone is happy.* Another school conservatively argued for slow, cautious movement and suggested that the following advice be heeded:

- Make certain that administrative approval and support is committed that will give authority and visibility to the CBTE effort.

- Involve everyone (faculty, students, administration, public schools, state department) early and provide for interdisciplinary work.

- Use a systems approach and program evaluation review technique--be certain that all activities and events are scheduled and delivered.

- Be prepared to reallocate resources (money, people, and space).

- Be realistic in terms of available resources.

- Design a faculty development system which among other things:

  Acquaints all with the CETEM program, supports faculty visits to CBTE schools, reviews literature on CBTE, brings consultant help in CBTE, program planning and evaluation, and reinforces or rewards faculty involvement.

- Either hire extra staff to free CBTE workers or reduce the present work loads. CBTE staff must have time off.

- Do a pilot program first, based upon revision of current courses.

Besides *jumping right in,* the first school of thought would try to get rid of or go around persons not supportive, develop a completely new program rather than revise the current one, and use CBTE materials which were already made elsewhere rather than develop modules on campus. The contrast between these schools of thought are obvious, interesting, and worthy of study to determine what precisely happens when a school goes one route as opposed to the other.

Note: The report from the study continues with elaboration of the findings relative to Goals 2,3, and 4. For more specific information, see the total document, The Development and Effectiveness of Competency Based Teacher Education Programs in Emerging Institutions, U.S. Department of Health, Education, and Welfare, Office of Education, Bureau of Research, Washington, D.C., December, 1973, Final Report, No. OEG-0-72-0778.